Machine and Tool
BLUE BOOK

ESTABLISHED 1906

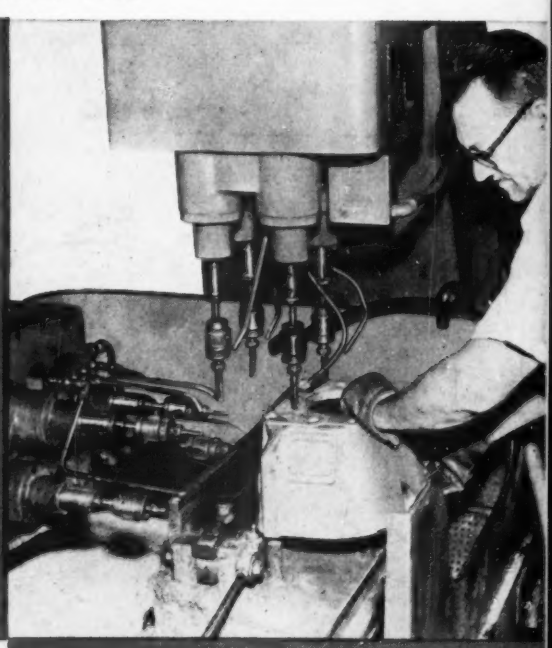
JULY 1954

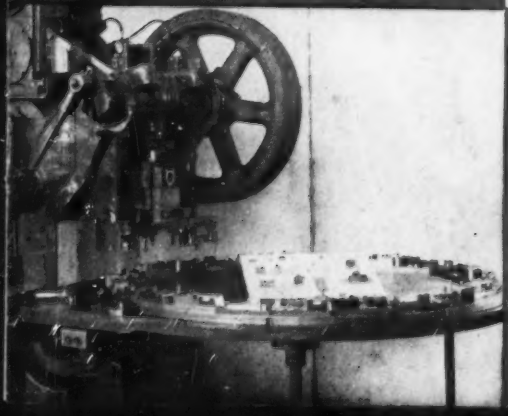
Reclaiming Overmachined Parts

Special Report on Presses

New Developments in Production Tapping

Reduce Costs With Dial Feeds





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Last Minute Washington News

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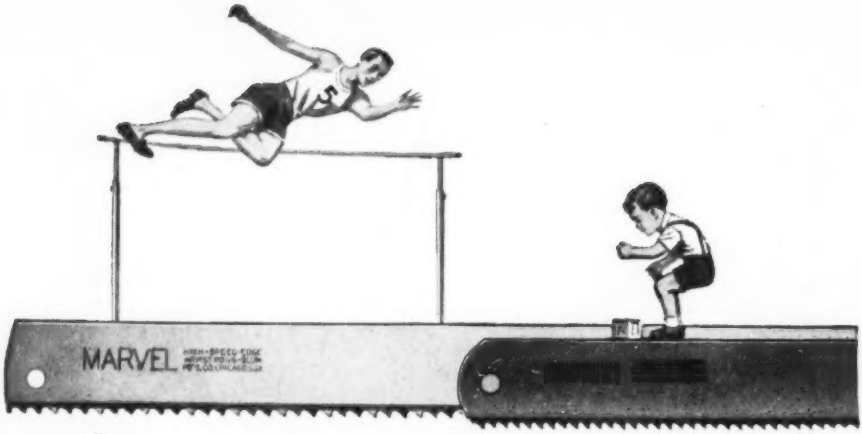


. . . but

Experience Cannot be Copied

More than a quarter-century ago MARVEL invented and basically patented the MARVEL High-Speed-Edge Hack Saw Blade—the UNBREAKABLE blade that increased hack sawing efficiency many-fold.

Every MARVEL Hack Saw Blade ever sold has been of that basic welded high-speed-edge construction, with constant improvements from year to year, as EXPERIENCE augmented the "know-how" . . .

MARVEL is not "tied" to any single source of steel supply, and has always used the best high speed steels that became available from time to time as metallurgy progressed. When-as-and-if finer steels are developed—and are proven commercially practical for welded-edge hack saw blades—MARVEL will use them, regardless of cost or source . . .

There is only one genuine MARVEL High-Speed-Edge! All other "composite" or "welded-edge" hack saw blades are merely flattering attempts to imitate—without the "know-how" of MARVEL EXPERIENCE . . .

Insist upon *genuine* MARVEL High-Speed-Edge when buying hack saw blades—and be SAFE, for you can depend upon MARVEL. They have been "tested", "pre-tested", and "re-tested" by thousands of users for more than a quarter-century!

MARVEL *Metal Cutting* **SAWS**

Better Machines—Better Blades

ARMSTRONG-BLUM MFG. CO. • 5700 Bloomingdale Ave. • Chicago 39, U. S. A.

A Jig Borer And Miller For Jobs Up To 30"x48"!

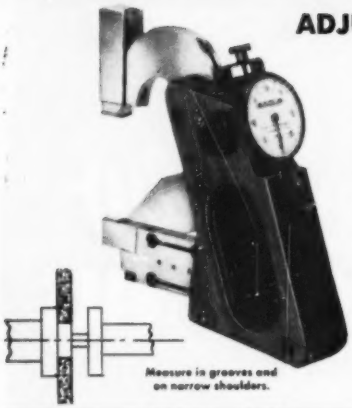
- Fulfills every requirement for accurate boring, drilling and vertical milling of large workpieces up to 5000 Lbs.
- Simplified setup, operation and inspection are possible because many parts are easier clamped on a table than mounted on a horizontal machine.
- All controls are in a single movable panel. Operator can control table and spindle from most convenient location without ever changing his position.
- Infinitely variable spindle speeds and feeds. Non-gear, easily maintained direct drives provide unusual smoothness of operation.
- 35" throat capacity—safety controls for machine, job and operator—unusually heavy construction—and a dozen other exclusive features.

Ask For Brochure

KNIGHT VERSATILE ACCURATE RIGID MILLERS

W. B. KNIGHT MACHINERY CO. • 3924 WEST PINE BLVD. • ST. LOUIS 8, MO.

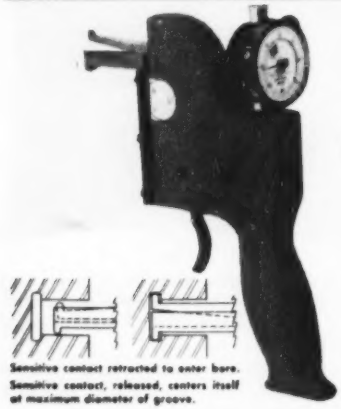
Two NEW gages get measurements IN THE GROOVE!



Measure in grooves and on narrow shoulders.

ADJUSTABLE INDICATING SNAP GAGES 1340 TYPE

THESE ADJUSTABLE SNAP GAGES show *actual* dimensional variations of .0001" because the gage rests on the "solid" upper anvil and the reading is not influenced by the weight of gage nor by the user's hand. The anvils are offset at front of gage and the upper anvil is readily adjustable. When it's locked at the desired position, minor adjustments are made by adjusting the Indicator Dial. The thin anvils and arms of these gages are particularly useful for measuring in grooves, slots, or between close shoulders. Inexpensive, adaptable and totally dependable, these new gages have a thousand uses in all shops — whether small or large.



Sensitive contact retracted to enter bore. Sensitive contact, released, centers itself at maximum diameter of groove.

ADJUSTABLE I. D. GROOVE GAGE

THIS NEW GAGE IS ADJUSTABLE TO MEASURE the diameter of a wide range of internal grooves as used for sealing or retaining rings. Adjustable to measure grooves between .725" and 2.625" diameter, it enters bores with diameters down to .500". Contacts at the ends of the arms check grooves even at the bottom of blind holes. Because the fixed contact is on lower arm, neither the weight of the gage nor pressure from the operator's hand affects the reading.

For the whole story on these NEW gages, write Federal Products Corporation, 4257 Eddy St., Providence 1, R. I.

Ask **FEDERAL**

FOR ANYTHING IN MODERN GAGES...

Dial Indicating, Air, Electric, or Electronic — for Inspecting, Measuring, Sorting, or Automatically Controlling Dimensions on Machines

44% FASTER

NEW ROTOR D-4 GRINDER

pays for itself in one month

They're lighter—easier to handle too!

ASK FOR BULLETIN NO. 43

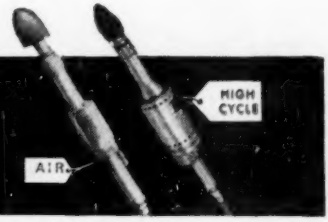
JOB: Grinding edges and holes of flame-cut tube hanger plates with 4" plug wheels.

FORMERLY: Used 4500 rpm grinders. Output: 50 pieces per day.

NOW: Use new Rotor D-4 8500 rpm Grinders. Output: 72 pieces per day.

RESULTS: 44% more output paid off cost of new Rotor Grinders in one month. After that, it's pure savings.

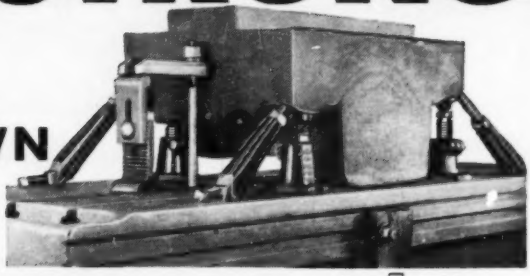
Find out from your nearby Rotor Analyst how *you* can cut costs with the D-4 and other new Rotor portable tools! Ask for a demonstration.



THE ROTOR TOOL CO.
CLEVELAND OHIO

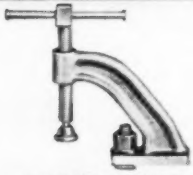
ARMSTRONG

SET-UP *and* HOLD-DOWN TOOLS



PLANER JACKS

ARMSTRONG Set-up and Hold-down Tools reduce setting-up time—keep men and machines producing. Designed for use on planers, drill presses, milling machines, etc., they hold work securely and rigidly, and thereby reduce spoilage and prevent costly accidents.



T-SLOT CLAMP

NON-SKID JACKS

Your local Armstrong Distributor carries ARMSTRONG Set-up and Hold-down Tools in stock in sizes for every operation. Stop haphazard setting-up methods. Provide each of your machines with a full complement of ARMSTRONG Set-up and Hold-down Tools.

Write for Circular

ARMSTRONG BROS. TOOL CO.

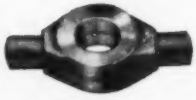
"The Tool Holder People"

5208 W. Armstrong Ave., Chicago 30, U. S. A.

STEP BLOCK

UNIVERSAL CLAMP

T-SLOT BOLTS AND NUTS



STRAP CLAMPS

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Hitchcock Managers are Listed on Page 64

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BPA

HEAVY LOAD/LIGHT WORK

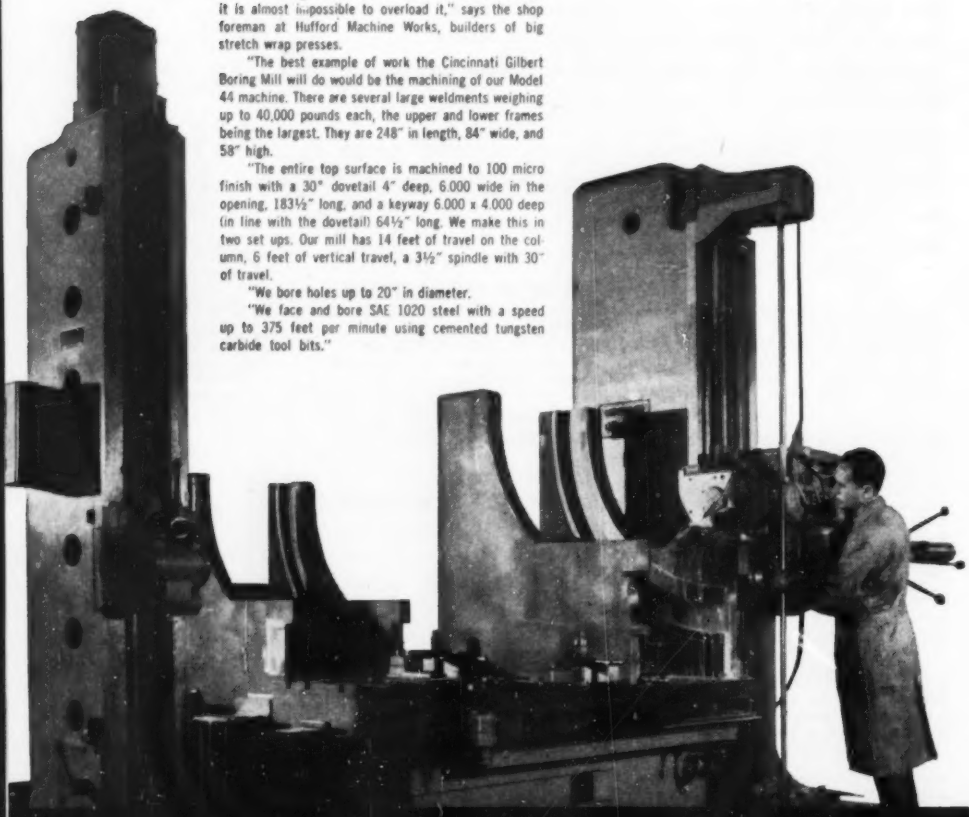
"The thing I like about the Cincinnati Gilbert is that it is almost impossible to overload it," says the shop foreman at Hufford Machine Works, builders of big stretch wrap presses.

"The best example of work the Cincinnati Gilbert Boring Mill will do would be the machining of our Model 44 machine. There are several large weldments weighing up to 40,000 pounds each, the upper and lower frames being the largest. They are 248" in length, 84" wide, and 58" high.

"The entire top surface is machined to 100 micro finish with a 30° dovetail 4" deep, 6.000 wide in the opening, 183½" long, and a keyway 6.000 x 4.000 deep (in line with the dovetail) 64½" long. We make this in two set ups. Our mill has 14 feet of travel on the column, 6 feet of vertical travel, a 3½" spindle with 30" of travel.

"We bore holes up to 20" in diameter.

"We face and bore SAE 1020 steel with a speed up to 375 feet per minute using cemented tungsten carbide tool bits."



Centralized controls, frictionless response, maximum flow of power from motor to tool make light work of heavy loads on a Gilbert. Hufford uses a floor type machine with sliding table. Many other arrangements are available. Write for literature on these versatile machines.

GILBERT

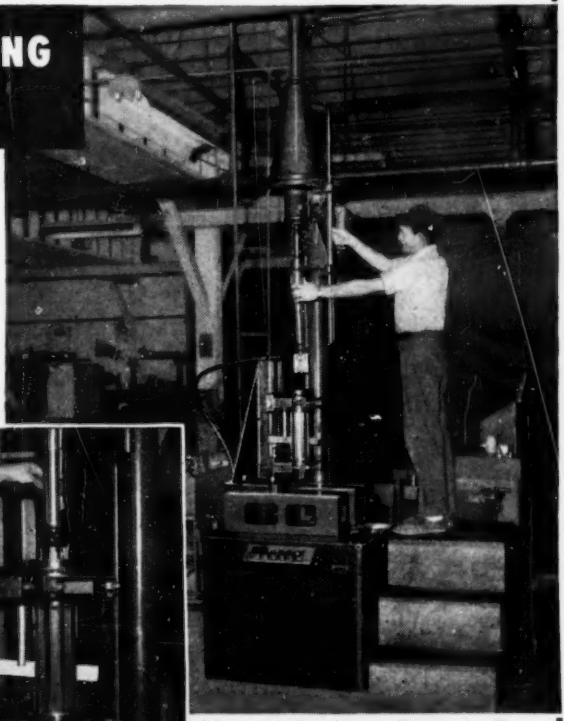
THE CINCINNATI GILBERT MACHINE TOOL COMPANY • 3366 BEEKMAN STREET, CINCINNATI 23, OHIO

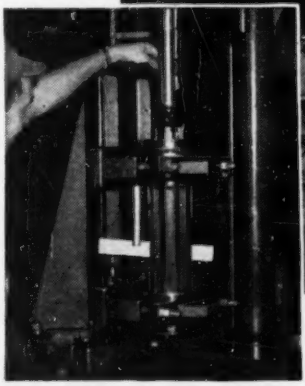
ONLY TWO EASY STEPS . . . BOTH AMAZINGLY SWIFT AND EFFICIENT

for fast precision finishing

FULMER HONING MACHINES

1. Honing stones SHEAR off the protuberances from the internal bores . . . then
2. FINISH the internal surfaces to geometric accuracy so rapidly that as much as 1/16 inch is removed from the diameter at a rate of 1½ to 2 cu. inches or more per minute





Fulmer Honing Machines speed cutting and finishing and insure dimensional accuracy to tolerance of .0001 ± in every internal honing operation for ferrous and non-ferrous metals, plastics, glass, etc.

Photograph shows Fayscott Corporation of Dexter, Maine, honing spindle sleeves for Giddings & Lewis boring mills.

C. ALLEN FULMER CO.

Write for bulletin on honing

1242 FIRST NATIONAL BANK BLDG. CINCINNATI 2, OHIO

CINCINNATI

Operation Profit—
Maintained Easier with
Cutting Tools Ground on Cincinnatis

No. 2
Cutter and Tool Grinder

Versatility and wide range, combined with accuracy and speed, give the No. 2 machines the highest endorsement for cutter maintenance in metalworking shops everywhere. The table rolls on balls between hardened ways . . . the grinding wheel spindle runs on anti-friction bearings contained in a cartridge . . . table ways and spindle unit replaceable at small expense. Swing over table, 10" diameter; maximum distance between centers, 27". Catalog No. M-1734

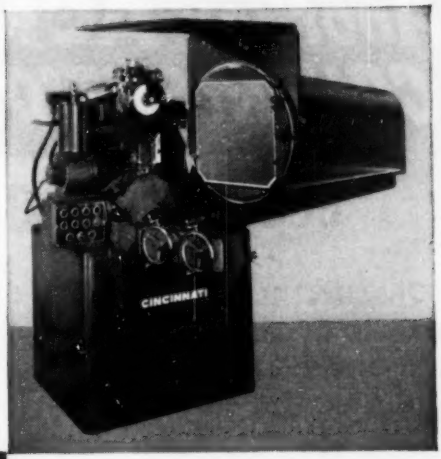
CINCINNATI

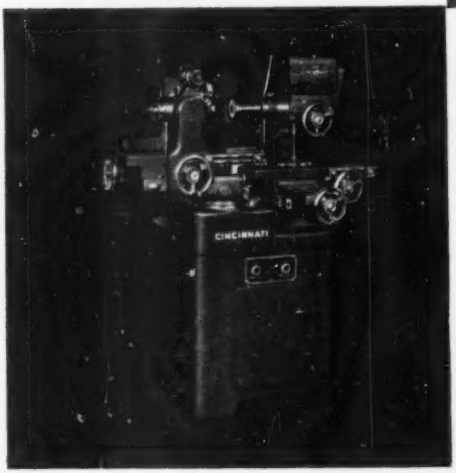
THE CINCINNATI MILLING MACHINE CO., CINCINNATI 9, OHIO

MILLING MACHINES • CUTTER SHARPENING MACHINES • BROACHING MACHINES • METAL FORMING

PROJECTO-FORM
Grinding Machine

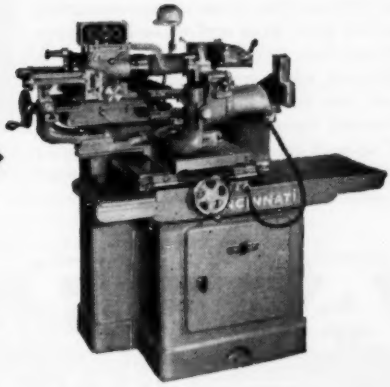
For grinding small, accurate profile shapes on flat form cutters, lamination die parts and similar components. This machine combines grinding with an optical comparator unit. Master drawings made on Layout Scribing Machine. Catalog No. M-1612-4.





MONOSET
Cutter and Tool Grinder

For sharpening, repairing, and making small cutters including countersinks, those required for die sinking, and other unusual shapes. Because of the universal construction, most jobs can be completed in one chucking. Catalog No. M-1591-2.



CONTOUR
Cutter Sharpening Machine

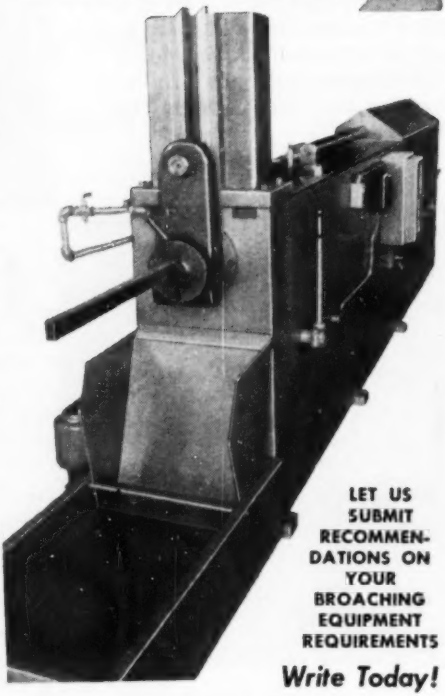
This machine grinds form milling cutters on the periphery of the teeth to a definite cutting clearance chosen for the work material. Catalog No. M-1552-1.

MACHINES • FLAME HARDENING MACHINES • OPTICAL PROJECTION PROFILE GRINDERS • CUTTING FLUID

Another ACME CONTRIBUTION ... to Economical BROACHING!

HORIZONTAL HYDRAULIC MACHINE . . . Specially *DESIGNEERED for Oil Well and Field Equipment!

• Basically, an Acme H-25T-66S Horizontal Hydraulic Machine with special fixture arrangement and oil pan to accommodate a variety of large and heavy crank arms for use in oil field pumping units. These arms require keyways for driving purposes and are made in various lengths and sizes . . . The large upright casting above the work part is lined with hardened and ground ways, and by inserting a machined plug in the upper end of these arms, this facilitates vertical alignment of various lengths of crank arms. The large bore at the lower end slips over hardened and ground interchangeable plugs to accommodate various bore sizes and these plugs have ground slots to guide the broach . . . In this case, where production of each size part was low, the use of the simple universal fixturing arrangement so that all sizes of crank arms could be keyway broached on a single machine resulted in substantial economies.



LET US SUBMIT RECOMMENDATIONS ON YOUR BROACHING EQUIPMENT REQUIREMENTS

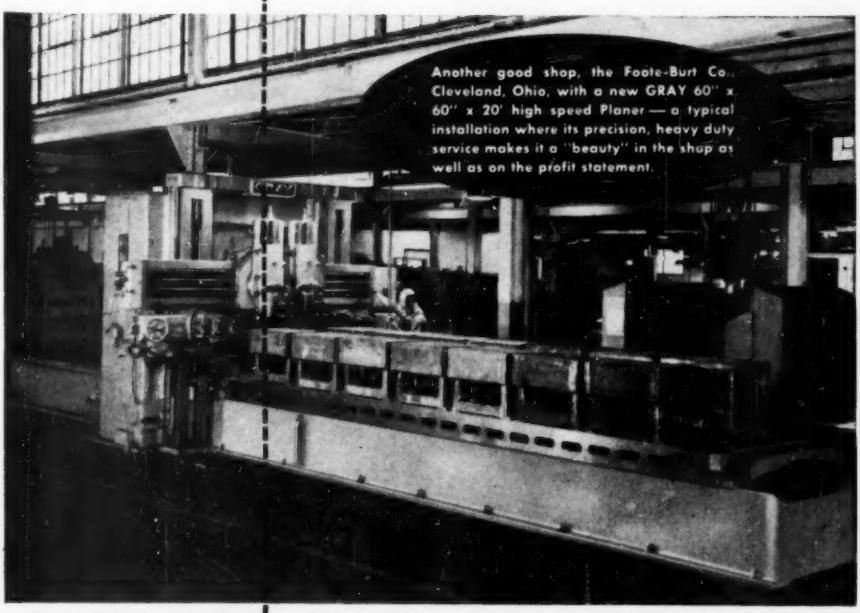
Write Today!

*DESIGNEERED . . . An ABC word coined to describe the creative design-engineering inherent in every product made by Acme Broach Corp.

ACME BROACH CORP.

MILAN, MICHIGAN

the sign of a good shop



Another good shop, the Foote-Burt Co., Cleveland, Ohio, with a new GRAY 60" x 60" x 20' high speed Planer — a typical installation where its precision, heavy duty service makes it a "beauty" in the shop as well as on the profit statement.

a new **GRAY** planer

. . . recognized by machine shops throughout the world as the ultimate in planers. Built for high production with great precision, combining more original engineering developments and production features than any other planer . . . it is in such demand that GRAY is the largest planer builder.

Write today. Get the story on GRAY
HIGH
low cost
PRODUCTION

DEPT. D

The G.A. **GRAY** *Company*

planers • milling planers • planer type milling machines • horizontal boring machines

CINCINNATI 7, OHIO, U. S. A.

SOLD IN CANADA BY UPTON, BRADEEN AND JAMES, LTD. • SOLD IN LATIN AMERICA BY MACHINE AFFILIATES

Quick Change of Set-Up Makes

...features of

Landis 10" x 24" Type CH Universal Grinder

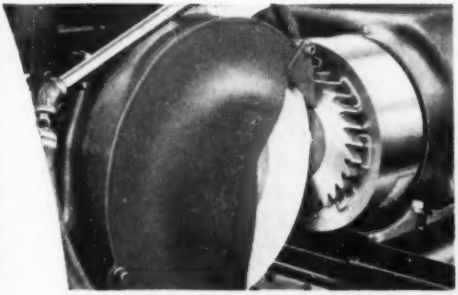
LANDIS

precision grinders

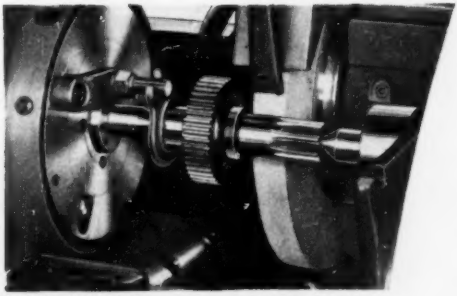
Modern operating features of Landis Universal Grinders permit quick set-ups. This gives flexibility and economy of operation for small lot manufacturing, toolroom and maintenance work. Write for Catalogs. Landis Tool Company, Waynesboro, Pennsylvania.

Small Lot Grinding Profitable

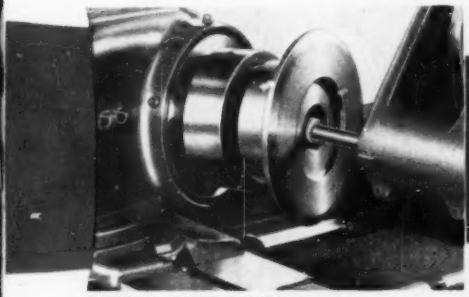
Landis Universals cut costs on precision grinding operations



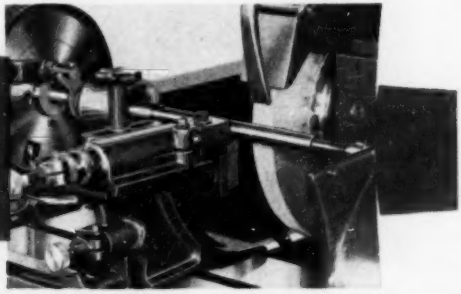
FACE GRINDING—magnetic chuck and low, compact swivelling headstock. Operator can make fast selection of correct speed.



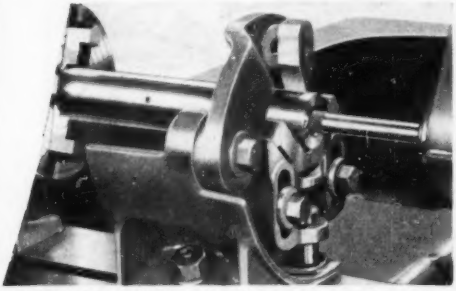
INFEED GRINDING—precision wheel feed and Microsphere wheel spindle bearings give accurate results and fast sparkout.



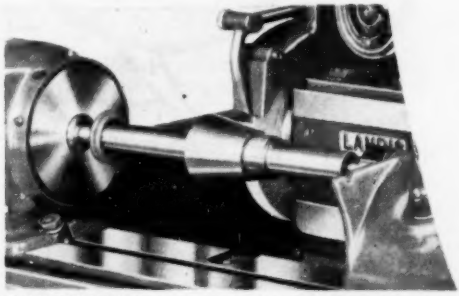
INTERNAL TAPER GRINDING—modern swing-type fixture provides quick changeover from external to internal grinding operations.



TRAVERSE GRINDING—use of automatic wheel feed saves time on short run traverse grinding jobs.



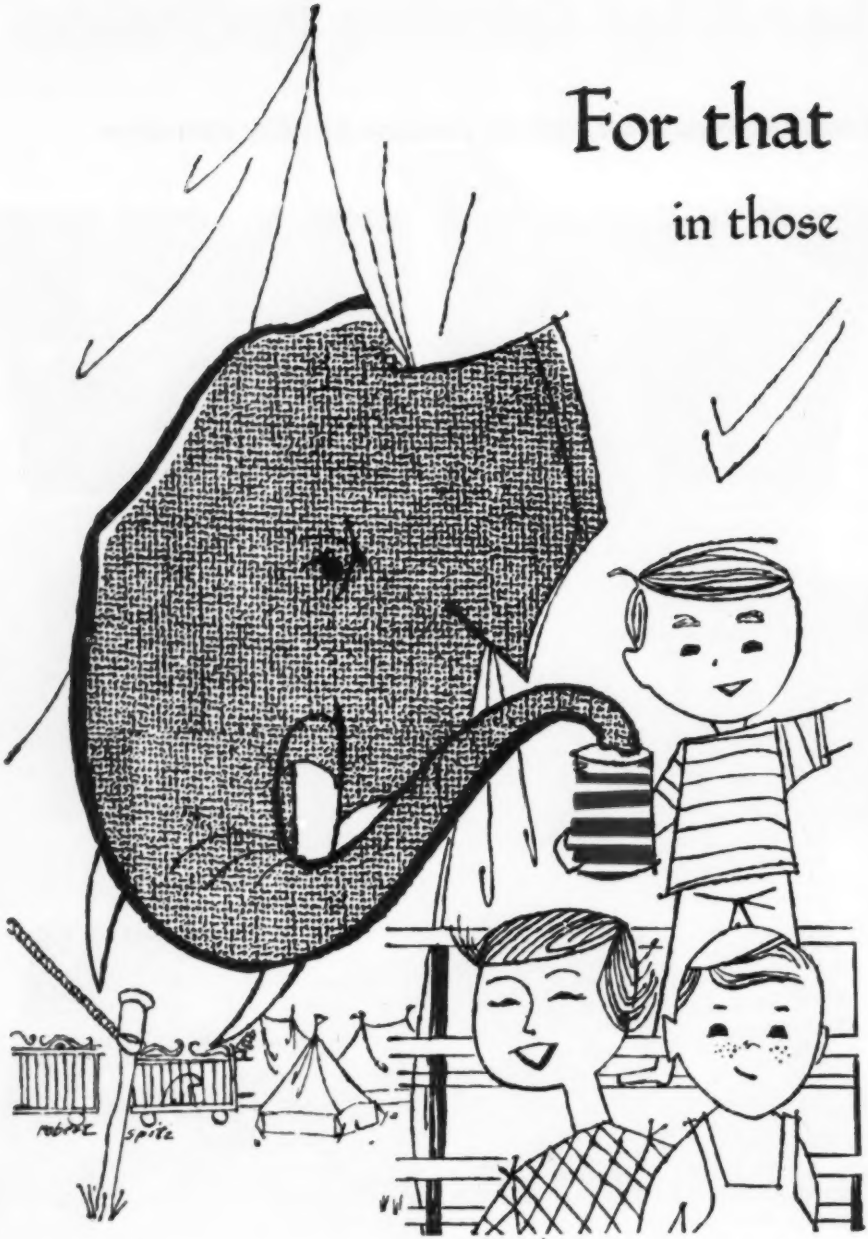
INTERNAL GRINDING—deep hole inside long work piece held in chuck and center rest. Wide variety of quills and wheels available.



TAPER GRINDING—tapers are easily ground. Piece shown has taper of 3.4° included angle. Wheelbase and headstock also swivel.

For that

in those

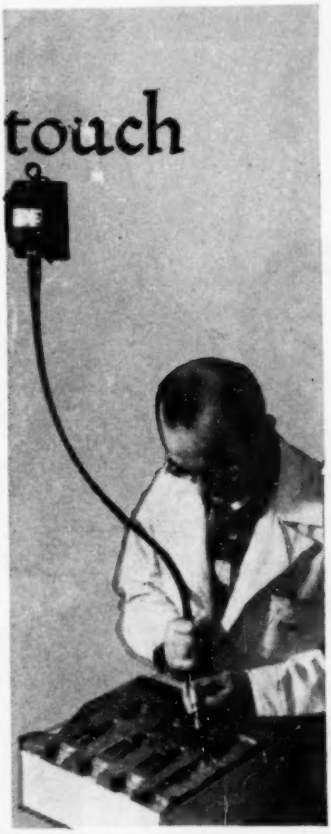


"light fingered" touch

hard-to-get-at places

VERSATILE POWER—OUT OF THE WEIGH

Power with the light-fingered touch—for those hard-to-get-at places! Haskins Flexible Shaft Equipment lets the power do the job without burdening skilled hands with heavy motors. For every job of grinding, sanding, filing, polishing or buffing—from ¼ HP to 2 HP—Haskins tools increase production and cut costs. Two good reasons why you should write for the latest Haskins Catalog.



The Haskins line provides a wide variety of models with drives, horsepowers, speeds, tools and attachments—including the one assembly exactly suited for your particular job.

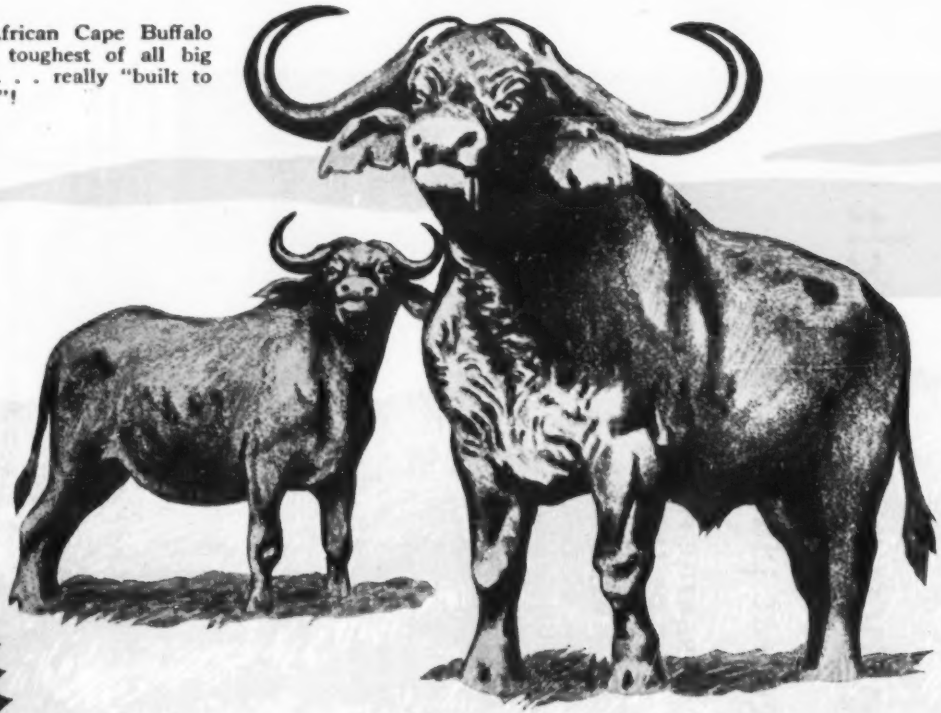
R. G. HASKINS COMPANY
2645 W. Harrison St., Chicago, Ill.

Pedestal

Bench

Suspension

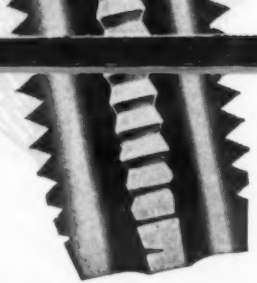
The African Cape Buffalo is the toughest of all big game . . . really "built to take it"!



RUGGED!

Bath Taps are "built to take it" too — during the daily grind

of screw machine operation or, on intricate threading jobs that



Bath Taps are "built to take it" too — during the daily grind of screw machine operation or, on intricate threading jobs that require special handling.

Records prove that a Bath Tap has produced 160,000 malleable iron union ring nuts at a surface speed of 120 feet per minute — that takes "guts" — the kind you need in today's assembly line production.

Rugged Bath Tap performance is dependent on these four essentials:

1. Experienced engineering and design.
2. Best quality basic steel.
3. Heat treating "know how".
4. Controlled methods of procedure.

Anyone can buy steel to specifications — but the real secret of rugged Bath Tap production is in the many years of experience in proper steel selection, heat treating, grinding, finishing . . . in the perfection of every controlled step of manufacture, plus the advantage of exclusive Bath equipment.

For taps that can "take it" — depend on Bath for long life and reliable service. Our representative will be glad to call and discuss your tapping and gaging problems.

Bath engineers check every detail, to see that all Bath Taps are conditioned to do the best threading job for your requirements.

Insist on BATH TAPS for BETTER THREADS

JOHN BATH & CO., Inc.

14 Grafton St., Worcester, Mass.

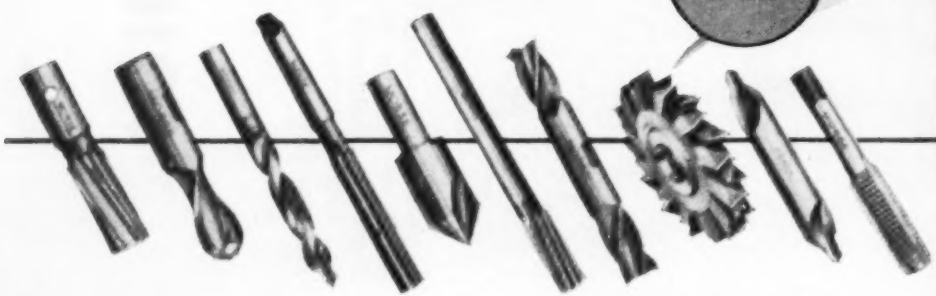
PLUG AND RING THREAD GAGES • GROUND THREAD TAPS • INTERNAL MICROMETERS

You get
"National Network Service"
when you hook up with a
Morse-Franchised Distributor

The five Morse warehouses are linked together with the Morse plant in a complete teletype network, coast to coast. And this instant, constant communication means that your Morse-Franchised Distributor is able to give you top-speed service no matter what your cutting-tool needs may be at any moment . . . and no matter whether the particular tools you need are available right at that moment at any single stock-point. He knows how to find them fast, and get them to you "quickest way". And that goes for the complete line of the finest cutting tools made . . . Morse Drills, Taps, Dies, Reamers, End Mills, Counterbores and Milling Cutters. *So always call your Morse-Franchised Distributor.*

MORSE TWIST DRILL & MACHINE COMPANY
NEW BEDFORD, MASSACHUSETTS
(Division of VAN NORMAN CO.)
Warehouses in New York, Chicago, Detroit, Houston, San Francisco

San Francisco
TWX No. SF-1068



MORSE

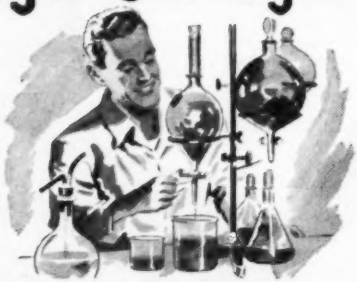
Cutting Tools

Buy them by phone from your Morse-Franchised Distributor and save ordering time

How to Pick the Right Cutting Oil

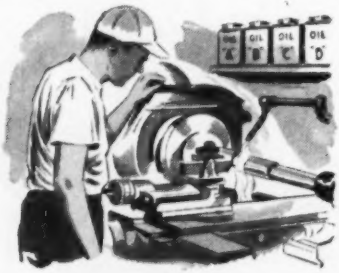
WORD OF MOUTH?

It gives you the answer sometimes, but not many of your friends have the same cutting oil requirements and the same problems that you have. It's much surer to depend on specialists like Sun.



LABORATORY ANALYSIS?

Sure. But there's no formula for correlating the laboratory analysis with how well the cutting oil will work on your job. It takes years of field experience like Sun's to help you make the right choice.



ELABORATE SHOP TEST?

This will probably give you the answer. But it's expensive and interferes with production when you try to test all the oils available. Sun's experience can help keep your shop-testing to a minimum.

EXPERIENCE IS THE ANSWER:

And Sun has it. Its field representatives have probably come across problems similar to yours many times. If they haven't, its cutting oil specialists and metallurgical technicians are ready to help with your problem.

Soluble or straight, transparent or black, light or heavy duty—Sun makes the kind of cutting oil you need to handle your job at the lowest cost. For more information, call your nearest Sun office or write SUN OIL COMPANY, Philadelphia 3, Pa., Dept. MT-7.

INDUSTRIAL PRODUCTS DEPARTMENT

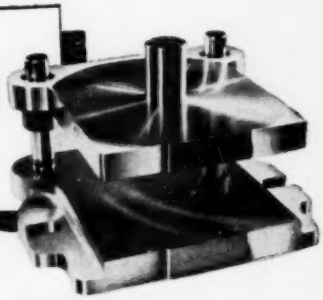
SUN OIL COMPANY

SUNOCO®

PHILADELPHIA 3, PA. • SUN OIL COMPANY LTD., TORONTO & MONTREAL

Refiners of famous High-Test Blue Sunoco Gasoline

World's fastest die set service in action



Here's where faster die set service begins, on Danly's high speed precision production lines . . . the finest mass production facilities in the die set field.

Here's where your order is received . . . in one of Danly's Branch Plants. Because all die components are close at hand, your order is filled immediately.

Now—Danly unites mass production techniques with the precision touch of craftsmanship to bring you the fastest die set service . . . ever.

Never before has there been a die set service as fast as the one that Danly now offers to you. Unique in concept, the system had its beginning some years ago when Danly originated its network of nationwide Danly Branches. Under such a system the main Danly Plant in Chicago provided thousands of *interchangeable* die set parts to Danly Branch Plants. It meant that such parts were easily assembled into standard die sets and then quickly delivered to meet the requirements of any tooling program.

But, as buyers recognized the convenience of Danly service, demands on the Chicago Plant grew to exceed capacity. The solution? . . . an unprecedented move in the die set field. Danly put die set manufacture on a mass production basis with no sacrifice of famous Danly precision. It was accomplished with amazing new facilities in the form of two complete production lines devoted exclusively to high speed, precision die set production. The next time you put one or a dozen Danly Die Sets on order, expect to get fast delivery from any Danly Branch, expect to get die sets unequaled in precision. You can expect it and you'll get it . . . when it's Danly.

DANLY

DIE SETS . . . STANDARD OR SPECIAL
DIEMAKERS' SUPPLIES

Fast, nationwide delivery from these plants

***CHICAGO** 50	2100 S. Laramie Avenue
***CLEVELAND** 14	1550 East 33rd Street
***DAYTON** 7	3196 Delphos Avenue
***DETROIT** 16	1549 Temple Avenue
***GRAND RAPIDS**	113 Michigan Street, N.W.
INDIANAPOLIS 4	5 West 10th Street
***LONG ISLAND CITY** 1	47-28 37th Street
***LOS ANGELES** 54	Ducommun Metals & Supply Co., 4890 South Alameda
MILWAUKEE 2	111 E. Wisconsin Avenue
***PHILADELPHIA** 40	511 W. Courtland Street
***ROCHESTER** 6	33 Rutter Street

**Indicates complete stock.*

CUT COSTS WITH MULTIPLE BENDING

Whether you're bending pipes, tubes, reinforcing bars or structural shapes, you can greatly increase your bending production by multiple die bending.

Shown here is our Model A-5 BENDING MACHINE tooled for bending 3 different radii without changing the set-up. In order to make multiple bending cost no more per die than single bending, individual dies are merely stacked on the die spindle and a shoe of the proper width permits the same degree to be bent without changing the automatic reset switch. The MODEL A-5 will bend pipe up to and including 2" standard weight pipe.

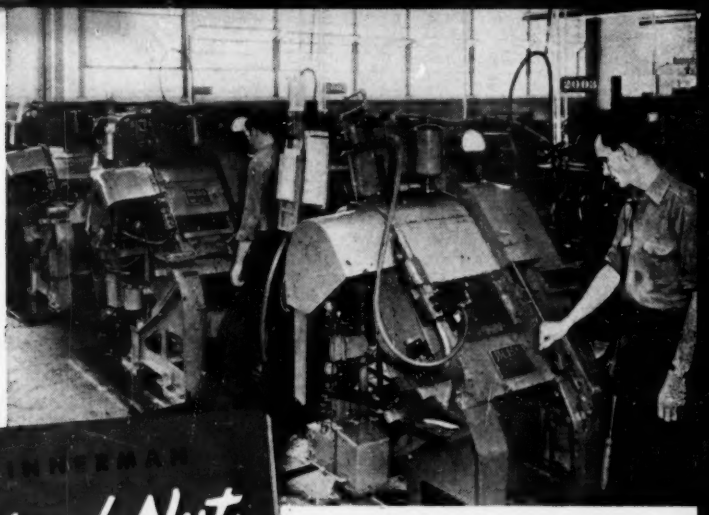
Redesigned and greatly improved, the Model A-5 still sells for only $1975. F.O.B. factory, U.S. Funds.

Smaller and larger machines available.

Write for detailed and descriptive folder.

Dept. 3

PEDRICK TOOL & MACHINE CO.
3640 N. LAWRENCE ST., PHILADELPHIA 40, PA., U.S.A.



Behind

stand these Bliss Presses

When it came to high-volume, low-cost production of its famous Speed Nuts, Tinnerman Products, Inc., turned to Bliss High Production presses. That is because Bliss HP presses provide definite operating advantages, especially on high-speed, progressive die operations.

Here's how the Bliss design cuts vibration and deflection to a minimum; maintains high output and long die life:

- Crankshaft with oversize crankpins supported in heavy box-type crown
- Frame of high-tensile, fine-grained Meehanite with heavy sections minimizing deflection
- Slide guided in bronze-lined square gibs throughout entire stroke and adjustment. Gibs are aligned to extremely close tolerances for very accurate slide guidance
- Rolls and feed adjustments built-in for precision feeding
- Compact design for high-speed operation
- Die area easily accessible from both front and rear of press for ease in setting complicated multiple-station dies.

If your metal stampings involve high-volume production and/or progressive die operations—you will find it worth your while to investigate Bliss HP presses. Let a Bliss sales engineer tell you about the large range of sizes, the full significance of these design features. Write for catalog.

E. W. BLISS COMPANY, CANTON, OHIO

E. W. Bliss (England) Ltd., Derby, England
E. W. Bliss Company (Paris), St. Ouen sur Seine, France
Presses, Rolling Mills, Special Machinery

"One or Several Copies Are Needed in Any Shop Doing Stamping Work"...*American Machinist*

Completely New

700 Pages • 450 Illustrations

Sections on: Computing press jobs • Selecting proper press • Useful engineering tables • Die illustrations • Complete glossary. Plus a service section for Bliss presses. **$7.50**

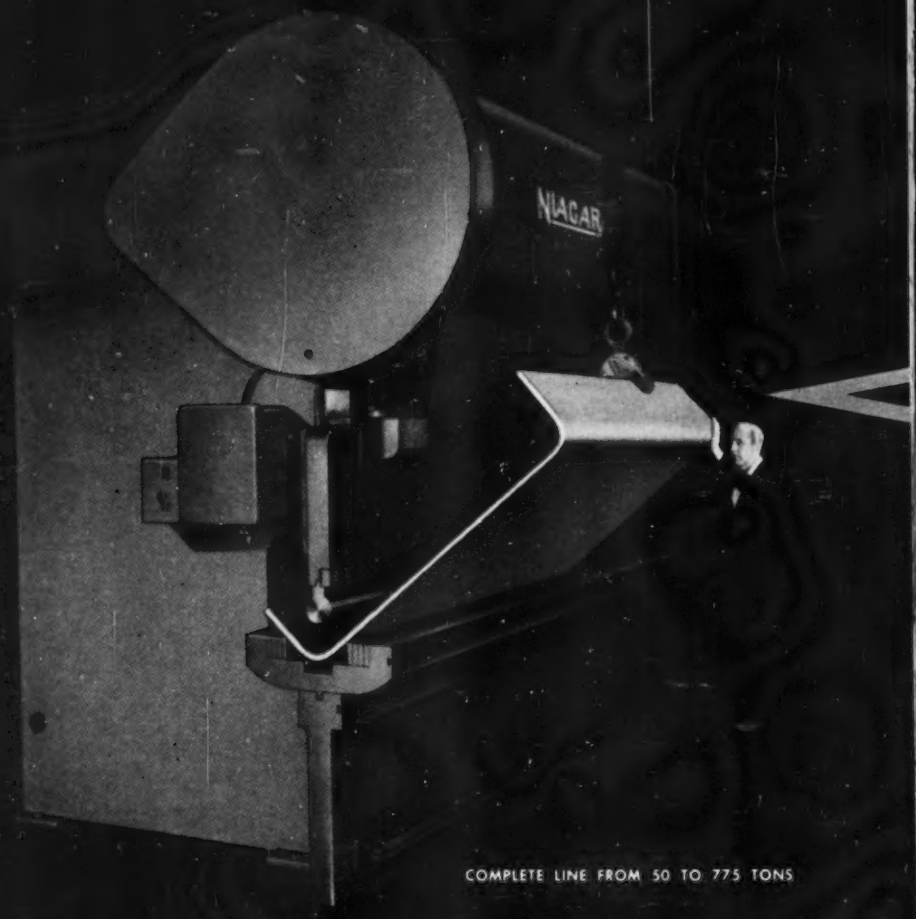
E. W. BLISS COMPANY—Handbook Dept., Canton, Ohio

It's Bliss!

From a single press for a given job . . . to a complete press room . . .

IT'S THE NEW, "YEARS-AHEAD" LINE...

Far out front on every point of comparison



COMPLETE LINE FROM 50 TO 775 TONS

NIAGARA MACHINE & TOOL WORKS 1879 75 1954

America's Most Complete Line of Presses, Shears, Machines and Tools for Plate and Sheet Metal Work

... NIAGARA

ALL STEEL PRESS BRAKES

"MULTI-MACHINE" VERSATILITY TO BOOST PRODUCTION

Practically limitless in their scope of forming, bending, punching, blanking and related operations, Niagara Press Brakes get more done for you because they do more jobs. One reason: Advanced design. Another: The extensive line of Niagara Press Brake Dies available.

UNIFORM BENDS WITH STRAIGHT-EDGE ACCURACY

Double end twin drives with double reduction gearing, *on all models*, provide uniform, constant application of power at both ends of the ram. Off-center loading presents no problem.

Rugged, streamlined frames feature box type crowns of unequaled strength and rigidity, assuring maximum resistance to deflection and permanent alignment of bearings and ram.

3-SHIFT STAMINA TO HANDLE WORK-HEAVY SCHEDULES

Close attention has been given to every design detail. Nothing has been overlooked. Each frame size has been scientifically tested to detect and eliminate harmful stresses at all critical points.

Laminated non-metallic ways, an exclusive Niagara feature, reduce wear to an absolute minimum, providing accurate alignment and longest possible service life. All gearing is totally enclosed in sealed oil baths for thorough, clean lubrication.

Once again, Niagara's forward-thinking engineering has produced a metal working machine years ahead of its time. As you become familiar with the significant developments embodied in this revolutionary new line of all steel press brakes, you will realize why it carries the Niagara nameplate. After all, who is more uniquely qualified to be its builder than the builder of America's most famed and most complete line of presses, shears, other machines and tools for plate and sheet metal work?

Call in your nearest Niagara representative at once. Let him tell you, *in detail*, what these great, new press brakes can do for you.

CHECK ALL THE FACTS, YOURSELF!

Compare. Make a careful, feature-by-feature appraisal of Niagara's years-ahead press brake design. Write for new Bulletin 89C . . . the most comprehensive press brake literature ever published.

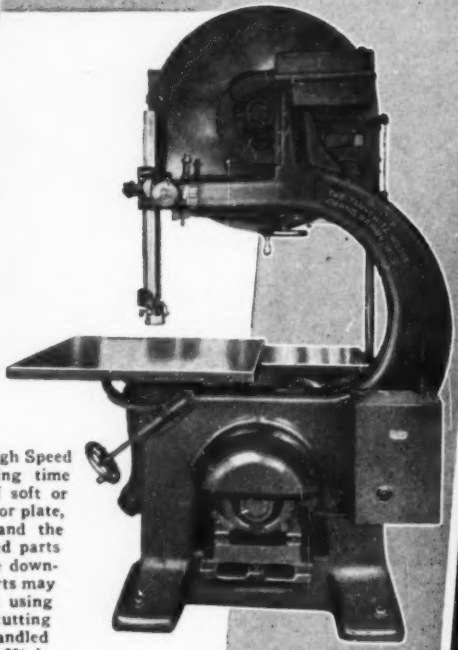
NIAGARA MACHINE & TOOL WORKS
BUFFALO 11, N. Y.
DISTRICT OFFICES:
Detroit • Cleveland • New York • Philadelphia
Dealers in principal U. S. cities and major foreign countries

engineered to expand your output ...AT SAVINGS!

Cutting Hard-Tempered 1/8" Chrome Moley Steel

Greatest Cost Saver in METAL CUTTING

Sawing 16" Steel Piling



FRICTION sawing with Tannewitz High Speed Band Saws results in perfectly amazing time savings in the cutting of flat sheets of soft or hardened steels, non-ferrous metals, armor plate, glass, plastics, many other materials and the trimming of castings. For cutting formed parts there's nothing to compare with it. The down-drag of the saw is so negligible that parts may be trimmed or sawn as desired without using a rest of any kind. Whatever your cutting requirements, chances are they can be handled faster and at less cost with Tannewitz High Speed Band Saws.

THE TANNEWITZ WORKS
GRAND RAPIDS, MICHIGAN

☎ GL-6-1729

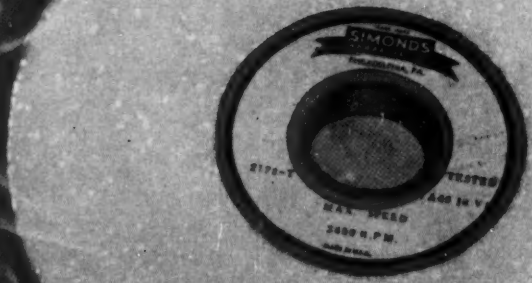
FRICTION SAWING

with **Tannewitz**

HIGH SPEED BAND SAWS

Write for Your Free Copy on Friction Sawing

fast, cool-cutting is in the bag!



A new protective bag! Polyethylene cellophane coated—heat sealed. Brings you clean, factory-fresh Simonds toolroom wheels every time you order. Ideal for high carbon, high chrome and other toolroom steels. Order from your Simonds distributor.

with

SIMONDS ABRASIVE CO.

W BOROLON GRINDING WHEELS

SIMONDS ABRASIVE COMPANY
PHILADELPHIA 37, PA.

BRANCH WAREHOUSES: BOSTON, DETROIT, CHICAGO, PORTLAND, SAN FRANCISCO • DISTRIBUTORS IN PRINCIPAL CITIES

DIVISION OF SIMONDS SAW AND STEEL CO., FITCHBURG, MASS. • OTHER SIMONDS COMPANIES: SIMONDS STEEL MILLS, LOCKPORT, N.Y.
SIMONDS CANADA SAW CO., LTD., MONTREAL, QUEBEC AND SIMONDS CANADA ABRASIVE CO., LTD., ARVIDA, QUEBEC

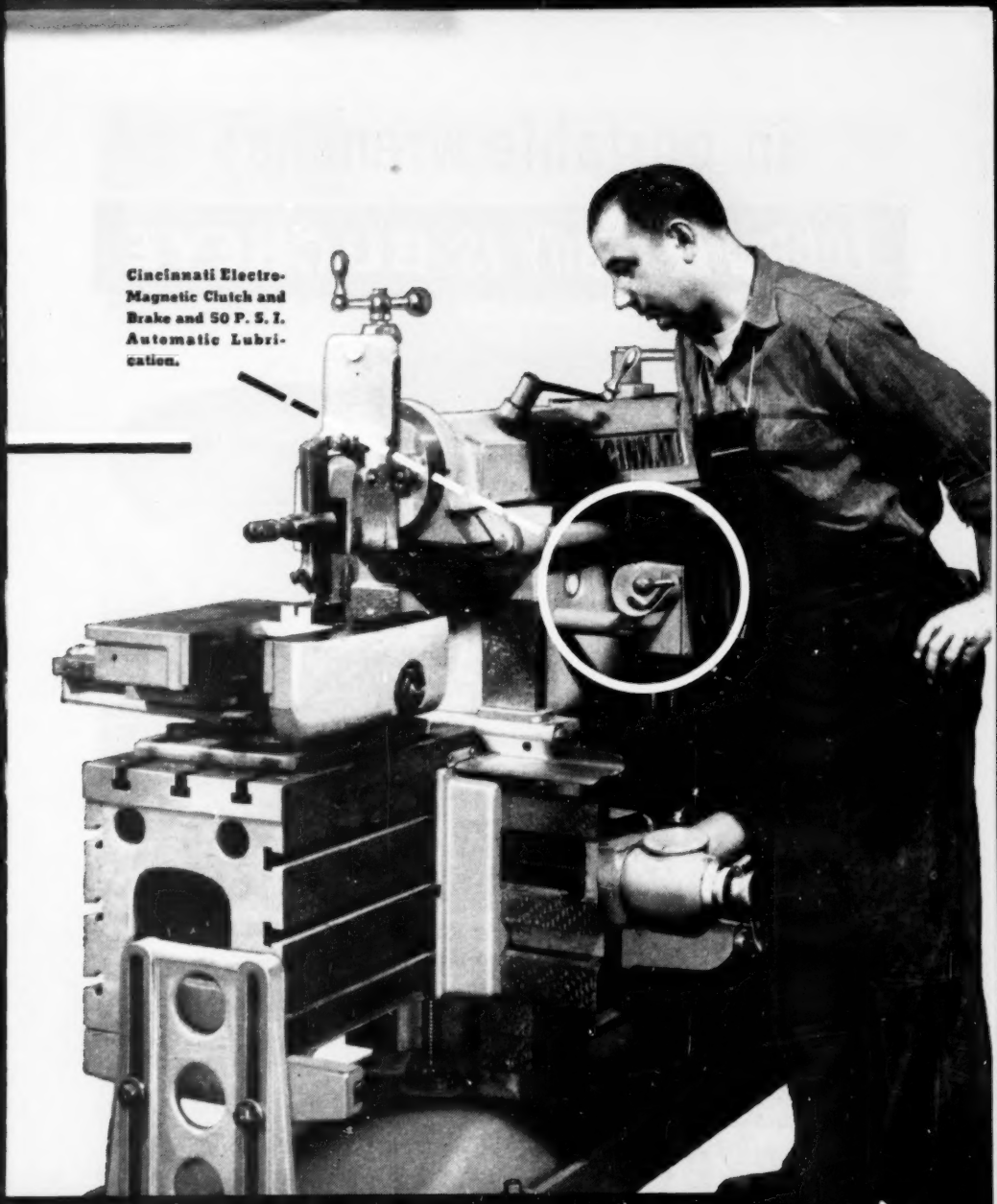
toolmakers prefer this CINCINNATI shaper

17 cubic foot Revco, one of many Food Freezer models built by Revco, Inc., Deerfield, Michigan.

Revco, Inc., producers of Food Freezers, state their toolmakers prefer using this 20" H. D. Cincinnati Shaper. They like the convenience of all controls located at the operator's position and the amazing speed of the electro-magnetic clutch and brake. They like the assurance provided by the 50 P.S.I. automatic lubrication. They like the very high accuracy obtained in shaping jigs and fixtures, drawing, forming and blanking dies.

Write for the new illustrated catalog N-6 on Cincinnati Shapers.

Photo courtesy Revco, Inc., Deerfield, Michigan



THE CINCINNATI SHAPER CO.

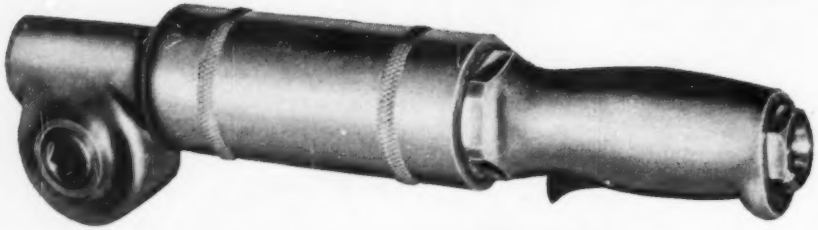
CINCINNATI 25, OHIO, U.S.A.

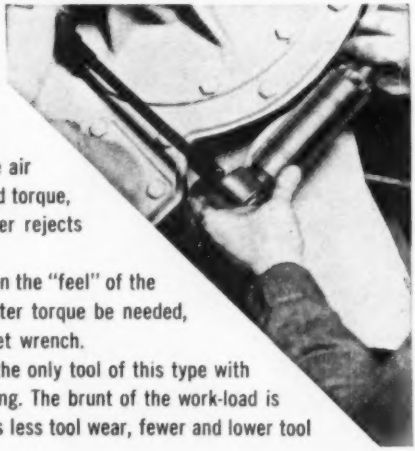
SHAPERS • SHEARS • BRAKES

CINCINNATI

in portable wrenches

YOUR BEST BUY IS BUCKEYE





Nutsetting with a Buckeye portable air-powered wrench is always easier—on the product, the operator and the tool!

Easier on the product—by simply regulating the air pressure, a Buckeye wrench will deliver the desired torque, up to maximum motor capacity. That means fewer rejects due to work spoilage.

Easier on the operator—there's no need to rely on the "feel" of the work to know when the job is done. Should greater torque be needed, the tool can be used, with the air on, as a ratchet wrench.

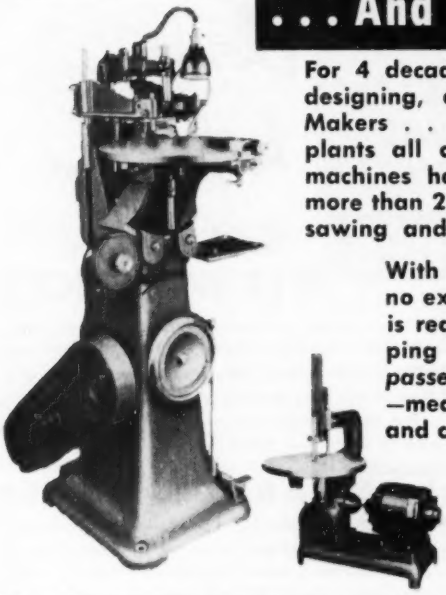
Easier on the tool—the Buckeye air wrench is the only tool of this type with power provided through planetary **and** worm gearing. The brunt of the work-load is divided over a much greater gear area. That means less tool wear, fewer and lower tool maintenance costs.

You'll find complete details and specifications in our Air Tools Catalog—may we send you a copy? If you like, we'll arrange a trial-test of a Buckeye angle wrench in your own plant, without obligation.

Buckeye Tools
CORPORATION
DIVISION 14 • DAYTON 1, OHIO

producers of the world's first successful rotary air tools

Get Unsurpassed
Accuracy, Speed and Efficiency *with* OLIVER DIE MAKING MACHINES
. . . And Save Up To 60%



For 4 decades, Oliver of Adrian has been designing, engineering and producing Die Makers . . . reliably serving thousands of plants all over the world. Many of these machines have been in continuous use for more than 25 years—making dies by machine sawing and filing—the proved Oliver Way.

With long lasting OLIVER DIE MAKERS, no expensive, hard-to-get skilled labor is required for sawing, filing and lapping operations. Yet you get *unsurpassed* Accuracy, Speed and Efficiency —meaning tremendous savings in time and costs—as much as 60%.

BE WISE, OLIVERize—for Die Making that will *best* meet your requirements.

OLIVER DIE MAKERS *Available in 5 Models*

The Bench Model S-1 (illustrated) is a single speed die maker for use on tool steel up to 1" thick.

The Heavy Duty Model (illustrated) has 6 speeds, works in metal up to 3" thick, has variable strokes to 5" with hydraulic feed.

***Write Today For Complete Technical Data on* OLIVER DIE MAKERS**

See our catalog in Sweet's Directory

MACHINE TOOLS by OLIVER include:
AUTOMATIC DRILL GRINDERS
TOOL & CUTTER GRINDERS
DRILL POINT THINNERS
TEMPLATE TOOL GRINDERS
FACE MILL GRINDERS
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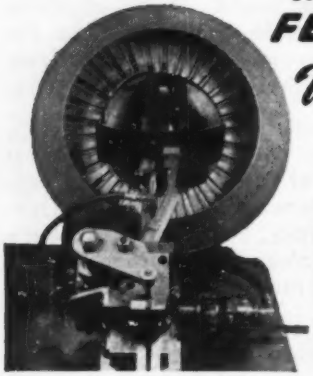
OLIVER INSTRUMENT CO.

1408 E. MAUMEE • ADRIAN, MICHIGAN

Get on the Right "TRACK"...

with your SMALL PARTS!

DISCARD SLOW MANUAL FEEDING!



Use **DPS** **SELECTIVE FEEDING DEVICES**

● Note the improvement in Lower Costs, Speedy Production, Quality Control and Increased Profits . . . Now, this DP Scontribution to the metal-working industry is emphasized in an expanded line of selective feeding devices and engineering service . . . Tell us your requirements; we have the unit and the know-how to meet your needs.

DPS BARREL-FEEDER

● Here is an interesting case showing separate screws and lock washers that were loaded into a single feeder and ejected loosely assembled at the rate of 60 to 70 a minute . . . An amazing speed increase over slow, manial operation. In this instance, as in thousands of other applications, the unit was designed with the idea of maximum feeding of a wide variety of parts at a fraction of the cost of manual feeding.

DPS BOWL-FEEDER

● An electric, vibrating unit that advances the parts on a circular spiral, aligning and correctly locating them to issue directly into the work area in proper time cycle. Provides fully automatic feeding of light, fragile parts that normally could not withstand tumbling.

Let us diagnose your symptoms and prescribe the proper remedy. Write for details.

DETROIT POWER SCREWDRIVER CO.

2809 W. FORT ST. DETROIT 16, MICHIGAN

Production goes up with W&B REAMERS

Illustrated above is the reaming of a gear case for an escalator mechanism. A 2.98" diameter Whitman & Barnes shell reamer was used on this reaming operation by a large manufacturer of elevators to secure maximum production, best possible reaming results and reduced costs.

In the complete line of W&B reamers you will find a type and size for nearly every application—each reamer designed and manufactured to the highest standards. Thus, regardless of your reaming application, W&B reamers provide greater production, more holes per grind, longer reamer life, chatter-free operation and accurate holes having super-fine finishes. Be sure your every reaming operation is done with highest efficiency—specify W&B reamers.

W&B

YOUR INDUSTRIAL DISTRIBUTOR
Can Give You Quick Service
On Whitman & Barnes Tools.
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WHITMAN & BARNES

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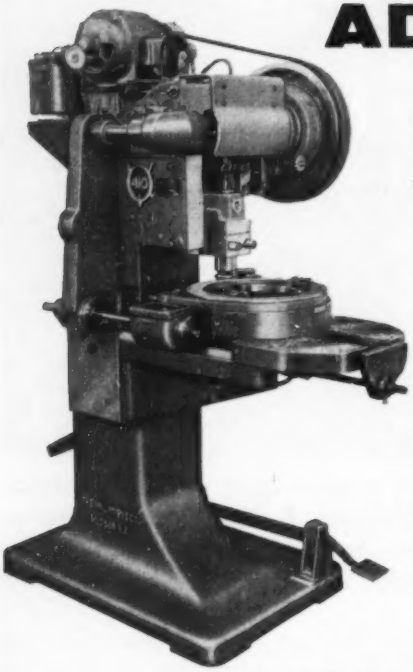
PRECISE, STURDY, ADAPTABLE



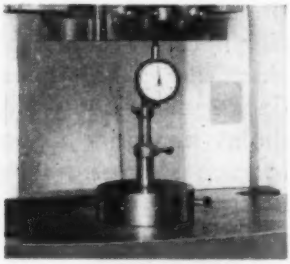
The V & O Notching Machine is so high in precision that it qualifies as a machine tool.

Because they are built like machine tools, V & O presses maintain precision throughout their operating strokes, are sturdy for trouble-free endurance, and are adaptable for clever tooling and for automation. With V & O presses you can safely use higher-cost tooling, depend upon higher precision production, and reduce costs with automation.

V & O was born for solving the problems of press automation. We have specialized on automation for 65 years. The full story is yours for the asking.

WHY THE V & O LONG SLIDE PROVIDES BETTER ALIGNMENT

With the same running clearance, the longer the slide the less the possibility for angular misalignment. And we keep our running clearances very close indeed.



Square and parallel within .0005" on a 4" stroke, is an ordinary V & O specification. Finer specs. if you need them.

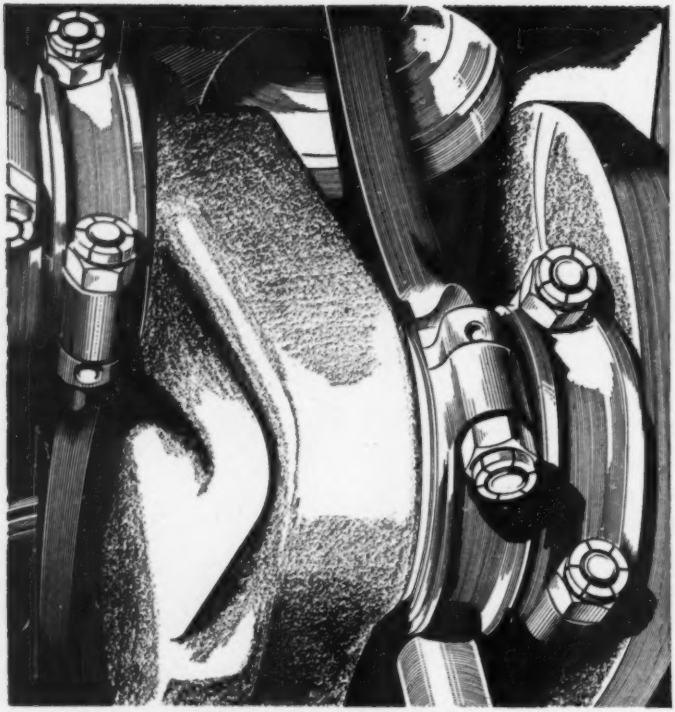
THE V & O PRESS COMPANY

DIVISION OF EMHART MFG. CO.

HUDSON, NEW YORK

BUILDERS OF PRECISION POWER PRESSES AND FEEDS SINCE 1889

If These Tools
Could Talk
They'd Speak
Precisely!
Brown & Sharpe Machinists' Tools "tell" you measurements accurately, dependably . . . minimize the chance for error due to "touch" or "feel". This reliability makes your craftsmen more confident, and confident craftsmen work faster. That's why it will pay you to standardize on these tools of highest quality. Write for new Catalog 35M . . . a valuable aid for ordering literally hundreds of standard types. Brown & Sharpe Mfg. Co., Providence 1, R.I., U.S.A.
BUY THROUGH YOUR LOCAL DISTRIBUTOR
Brown & Sharpe
B·S

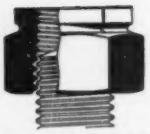


More and more automotive repair shops and industrial plants are turning to FLEXLOCs to reduce maintenance on high speed, vibrating equipment.

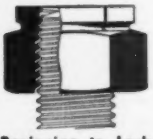
FLEXLOC locknuts save $600 per year in reconditioning automobile engines

By using FLEXLOCs on connecting rod bolts, a motor reconditioning shop cut assembly time by a minimum of 5 minutes per motor. This added up to a yearly saving of 250 hours or $600. No drilling of bolts was needed . . . no adjusting of nuts to set cotter pins was required. And the FLEXLOCs assured a tighter assembly than was possible with the castellated nuts and cotter pins formerly used. FLEXLOCs are reusable. They can be applied again and again without losing locking efficiency.

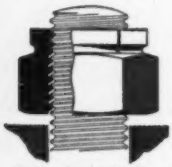
You can get FLEXLOC Self-Locking Nuts of various types and materials in a wide range of sizes from leading industrial distributors everywhere. Write for literature and samples for test purposes. STANDARD PRESSED STEEL Co., Jenkintown 52, Pa.



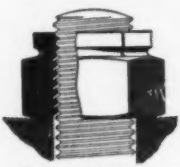
Starting. A FLEXLOC starts like any ordinary nut. Put it on with your fingers. Tighten it with a standard hand or speed wrench.



Beginning to Lock. As the bolt enters the segmented locking section, the section is expanded, and the nut starts to lock.



Fully Locked As a Stop Nut. When 1½ threads of a standard bolt are past the top of the nut, the FLEXLOC is fully locked. A FLEXLOC does not have to seat to lock.



Fully Locked As a Seated Nut. When it is used as a lock or stop nut, the locking threads of the FLEXLOC press inward against the bolt, lifting the nut upward and causing the remaining threads to bear against the lower surface of the bolt threads. Vibration will not loosen a FLEXLOC, yet there is no galling of threads.

FLEXLOC LOCKNUT DIVISION

SPS

JENKINTOWN PENNSYLVANIA

PUTNAM END MILLS

Cut Time and Tool Costs

Time and Tool Costs are Cut by using Putnam End Mills. For, they are properly designed and carefully manufactured for free cutting action, longer life and ability to "stand-up" when operated at high speeds and heavy feeds.

Proven Putnam End Mill superiority assures the ultimate in efficient milling of dies, tough-to-machine materials, non-ferrous metals, etc.

Give them a try on your rugged milling operations and watch them really "hog" in and remove stock.

PUTNAM

2981 CHARLEVOIX AVENUE • DETROIT 7 MICHIGAN

New Norton Cut-Off Wheels Get Industry's O.K.!

Reports from every section of the country tell how the freer cutting, longer lasting R50 and B9 add the profit-boosting "TOUCH of GOLD"

Here's what they say about–

The R50

143 more cuts
California mine bit manufacturer rates R50 rubber cut-off wheel best ever used. Gave 735 cuts to competitive wheel's 592, for 24% more wheel life.

Better performance
Connecticut machine tool manufacturer says R50 wheel outperformed competitive wheel, cutting freer on wet cutting of high carbon tool steel. (see photo).

120% longer life
Indiana construction equipment manufacturer reports R50 wheel produced 216 cuts, 120% more than competitive wheel's 98 cuts.

No burn or breakage
Kentucky manufacturer of garbage disposal units found R50 wheels eliminated the breakage problem and produced a cut free of burr and burn.

450 more cuts
Missouri manufacturer of coal mining equipment used an R50 wheel to cut 12 bars at 90 cuts per bar, totalling 1080 cuts. Beat best previous wheel's record of 7 bars, 630 cuts, by 70%.

Freer cutting, longer lasting
Massachusetts manufacturer of pneumatic tools reports R50 wheel 25% more durable while producing an equal quality of cut. Freer cutting, with less of usual rubber wheel odor.

25% more cuts
Connecticut machine manufacturer reports R50 wheel produced 25% more cuts than competitive wheels, with equal freeness and cleanness of cut.

The B9

72% more durable
Michigan engine manufacturer says B9 wheel produced 250 cuts over competition's 145, lasting 72% longer.

Lasted three times longer
Ohio metal working company reports B9 gave three times the service life of competitive wheel, with excellent cutting performance.

40% more cuts
Pennsylvania die manufacturer found B9 wheel out-produced competitive wheel by 40% giving 252 cuts as against 180.

36% production increase
Missouri metal company tells how B9 gave 75 cuts to competition's 50-55, proving 36% longer lasting.

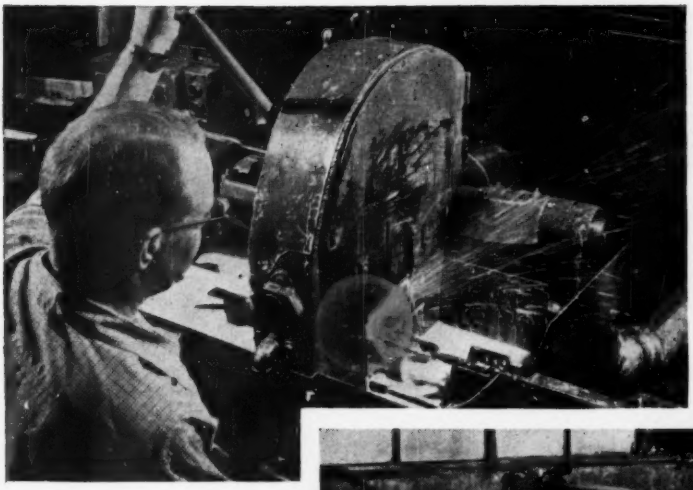
Best wheel ever used
Michigan tool manufacturer, using B9, gets twice the number of pieces previously cut. B9 rates best wheel ever used on this job.

150% over competition
Maryland metal working company says B9 wheel gave 125 cuts, topping competitive wheel's 50 cuts by 150%.

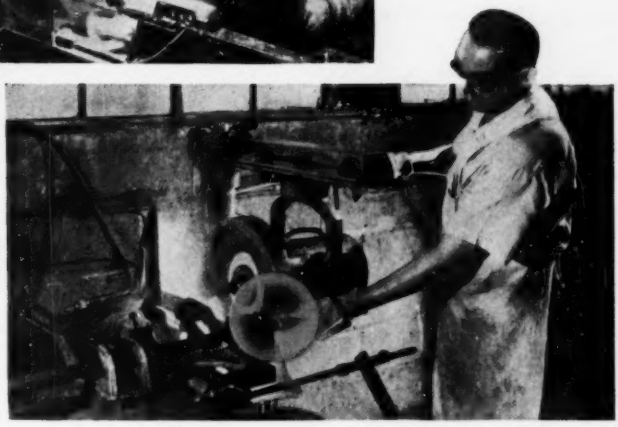
42% more cuts
Pennsylvania construction equipment manufacturer averaged 125 cuts with B9 wheel, 42% over competitive wheel's average of 88 cuts.

85% longer life
California forge and pipe foundry reports B9 lasted 85% longer than any other wheel.

27% more durable
Ohio aircraft manufacturer, cutting a wide variety of bar stock, says B9 wheel delivered 27% longer life than competitive wheels. (see photo).



The New Norton R50 rubber bonded cut-off wheel is designed especially for wet-cutting of ferrous or non-ferrous bar stock up to 6" diameter. Built-in chip clearance — a great advancement in this type of wheel — is one of its special "Touch of Gold" advantages that assure freer, faster cutting with maximum strength and service life.



The New Norton B9 resinoid bonded cut-off wheel is made with either smooth sides or with the rough "F" sides for more clearance in the cut. It is a high production wheel, cutting free and cool with minimum burning. It will give you long, economical "Touch of Gold" performance in the widest range of ferrous and non-ferrous applications.

Performance reports like these are coming in every day, telling how the new Norton R50 and B9 cut-off wheels are setting new records for extra long service life and improved cutting action. Check them carefully, then judge for yourself how much your own cutting-off operations will benefit by these outstanding wheels. And remember: for every cut-off job you do, there's a Norton cut-off wheel that will add the money-saving "Touch of Gold."

See Your Norton Distributor for the cut-off wheels you need. Or write to NORTON COMPANY, Worcester 6, Mass. Distributors in all principal cities, listed under "Grinding Wheels" in your classified phone directory. *Export:* Norton Behr-Manning Overseas Incorporated, Worcester 6, Mass.

Making better products . . . to make other products better

W-1569

NORTON

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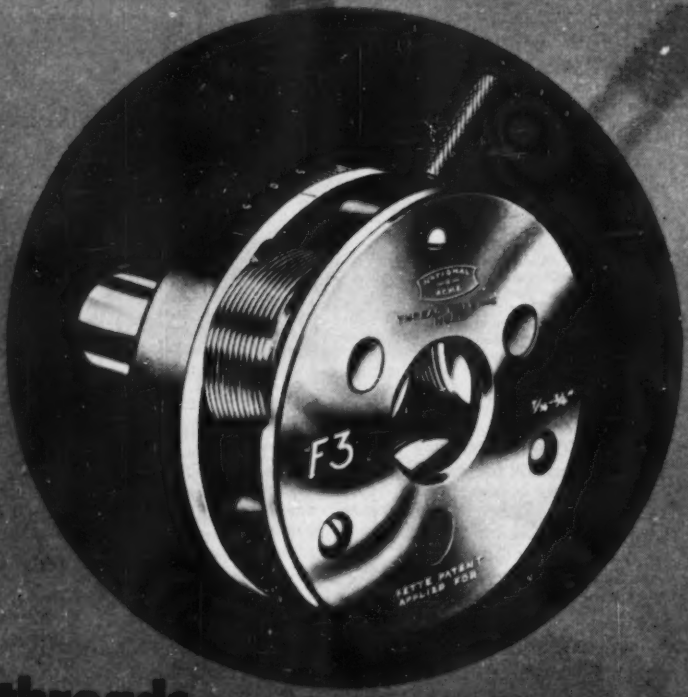
NORTON: Abrasives • Grinding Wheels • Grinding Machines • Refractories
BEHR-MANNING: Coated Abrasives • Sharpening Stones • Pressure Sensitive Tapes

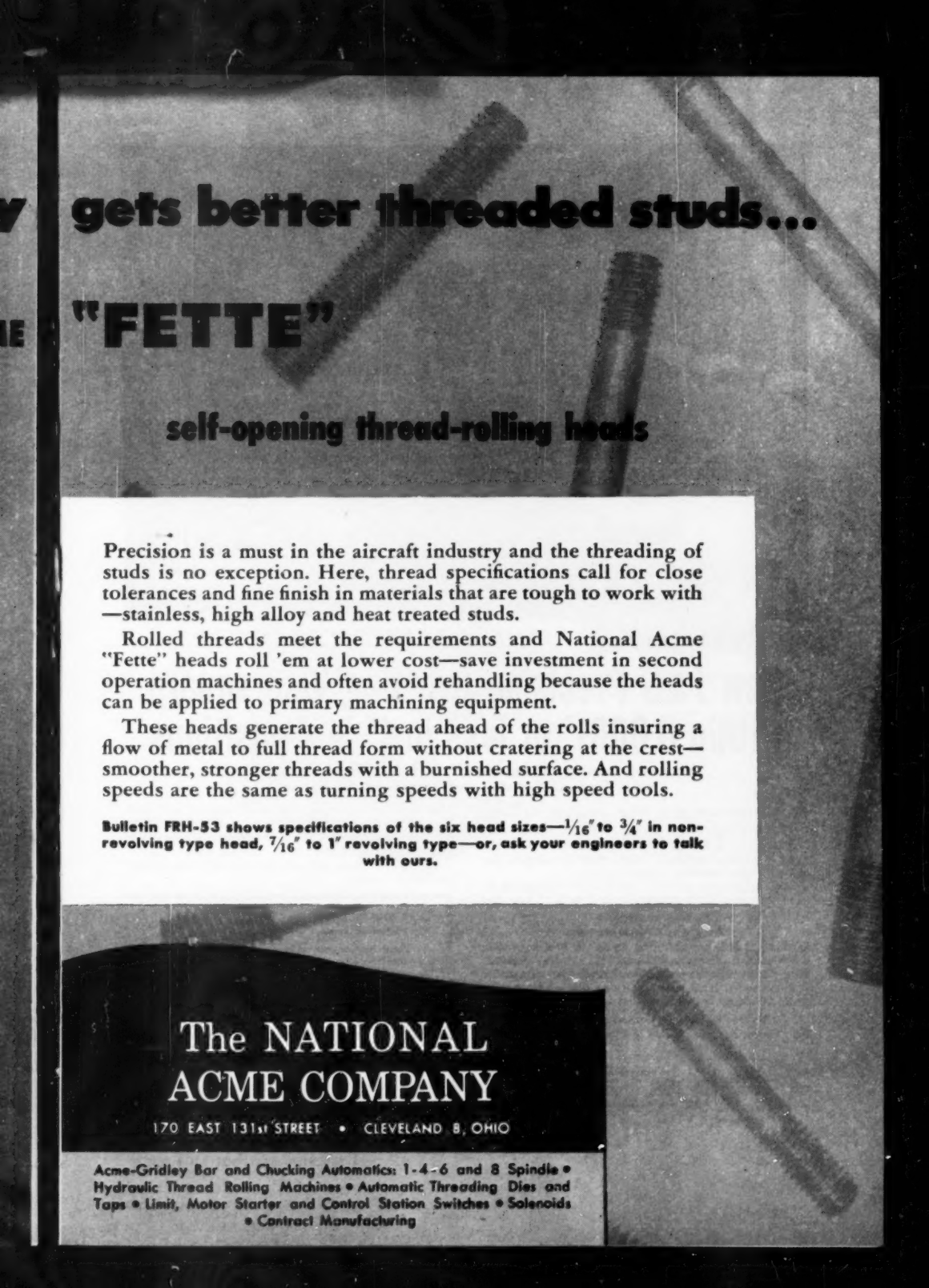
how the Aircraft Industry

with NATIONAL ACME



rolls threads...

FASTER • SMOOTHER •
STRONGER • CHEAPER
than any other tool



gets better threaded studs...

"FETTE"

self-opening thread-rolling heads

Precision is a must in the aircraft industry and the threading of studs is no exception. Here, thread specifications call for close tolerances and fine finish in materials that are tough to work with —stainless, high alloy and heat treated studs.

Rolled threads meet the requirements and National Acme "Fette" heads roll 'em at lower cost—save investment in second operation machines and often avoid rehandling because the heads can be applied to primary machining equipment.

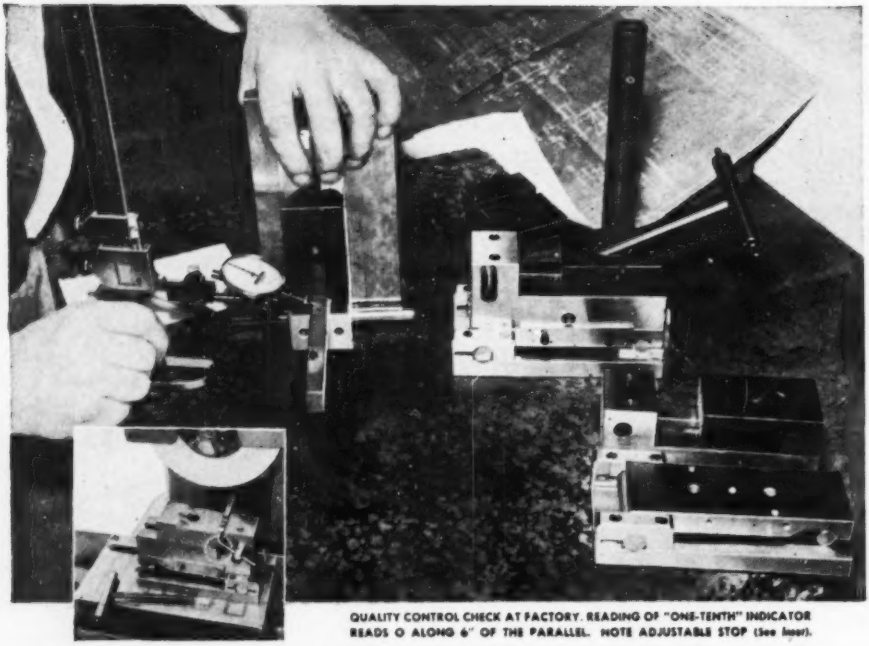
These heads generate the thread ahead of the rolls insuring a flow of metal to full thread form without cratering at the crest—smoother, stronger threads with a burnished surface. And rolling speeds are the same as turning speeds with high speed tools.

Bulletin FRH-53 shows specifications of the six head sizes—1/16" to 3/4" in non-revolving type head, 7/16" to 1" revolving type—or, ask your engineers to talk with ours.

The NATIONAL ACME COMPANY

170 EAST 131st STREET • CLEVELAND 8, OHIO

Acme-Gridley Bar and Chucking Automatics: 1-4-6 and 8 Spindle • Hydraulic Thread Rolling Machines • Automatic Threading Dies and Taps • Limit, Motor Starter and Control Station Switches • Solenoids • Contract Manufacturing



QUALITY CONTROL CHECK AT FACTORY. READING OF "ONE-TENTH" INDICATOR READS O ALONG 6" OF THE PARALLEL. NOTE ADJUSTABLE STOP (See Inset).

New J & S Precision Grinding Vise square within 0.0001" or less in 1" in 4 positions

Hardened, Ground and Lapped—Deep Frozen for Stabilization—Holds Tapered Diameters and Odd-shaped Workpieces

For inspection, grinding, milling, drilling and tapping, jig boring, layout work . . .

This new J & S "Square-perFect" Vise is one of the most practical precision vises ever developed. Its many helpful features explain why:

It is square, for example, with 0.0001" or less in 1" in 4 positions. It is attachable to J & S 5" sine bar with 0.100" recess for small angles.

Accurate, Adjustable Stop

Like all J & S workholding tools, it has a unique downholding clamping action. This assures dependable, accurate positioning of workpieces. An adjustable stop provides fast, *sure* positions for repeat operations. Workpieces can be loaded and unloaded rapidly.

Holds Tapered, Odd-shaped Workpieces

The clamping jaw of this J & S Precision Grinding Vise swivels to permit holding of tapered and odd-shaped workpieces. It holds round stock from 1/16" to 2½" in diameter in Vee-block fashion. The range of jaw openings is from 0" to 3".

Get all the facts without delay. Fill-in the coupon and mail it today.

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W. Mt. Pleasant Avenue, Livingston, N. J.

Please send me complete information on your J & S Precision Grinding Vise.

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performance and features equal to or surpassing machines costing up to 58% more!

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with a free chart comparing these 22 specifications on 8 leading mills!

- Price
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- T-Slots—number and width
- T-Slots—center distance
- Swivels
- Longitudinal Power Feed
- Cross Power Feed
- Vertical Power Feed
- Spindle Center Line to Top of Table—Max.
- Spindle Center Line to Top of Table—Min.
- Column to Brace
- Column to Inside Arbor Support
- Arbor to Underside of Overarm
- Taper Hole • Nose Diameter
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Features and dimensions are easy to compare . . . and so is performance, backed up by user reports stating that Greaves 2H plain and universal milling machines outperform mills costing almost twice as much!

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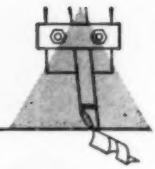
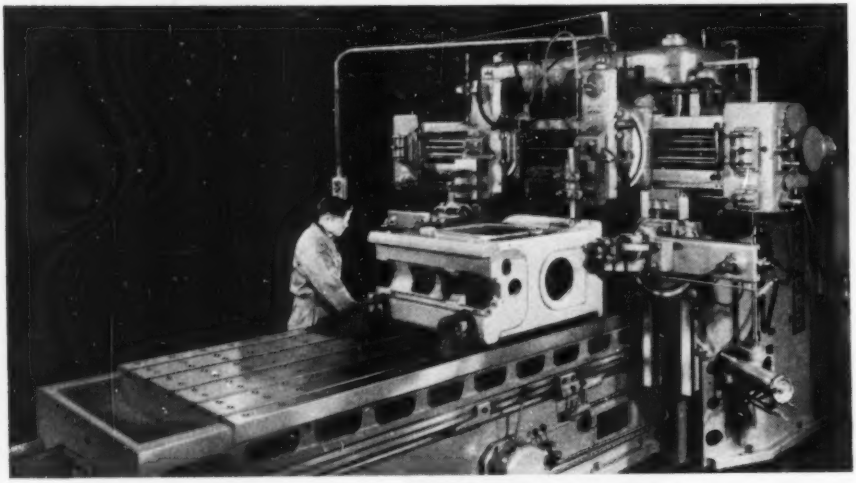
a cost cut . . . with every stroke

of rockford hydraulic-driven



planers



higher production is obtained with every stroke **because...**

the great new Triple Circuit offers the correct combination of cutting speed and force to most economically machine materials from the free-cutting types to the toughest steel.

Send us your Planing specifications. Ask for full details of the Triple Circuit planing efficiency.

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"The Man in the Barrel" recommends . . .

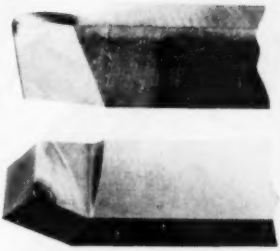
Stuart'S CUTTING OILS

balanced for your particular operations

● What is your operation? Gear shaping, high speed automatics? No matter . . . because Stuart Oil Company has a balanced cutting oil for you with just the right amount of lubricity, temperature control and chemical activity to provide the optimum in finish, production and tool life.

Stuart's Balanced Cutting Oils are made under laboratory control. You are assured of a uniform product that will produce the very best results obtainable under the conditions you will subject it to.

Perhaps you are blending your own cutting oils now . . . or using other types. Let a Stuart Representative, "the Man in the Barrel", explain and demonstrate a balanced Stuart Cutting Oil.
Fill in the coupon below today.



The cutting tool at top shows abnormal front clearance caused by *excessive chemical activity* of cutting fluid. The lower cutting tool shows cratering from *insufficient chemical activity* of cutting fluid.

More than a "Coolant" is Needed

D.A. Stuart Oil CO.
EST 1865 LIMITED

TIME-TESTED CUTTING FLUIDS AND LUBRICANTS

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Send a Stuart's Cutting and Grinding Fluid Selector Folder.

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No matter what your tool requirements may be – no matter how often tools must be changed–Beaver Quick-Change Tool Holders and Adaptors will save you money.
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Tooling can be installed
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Let us show you how it will
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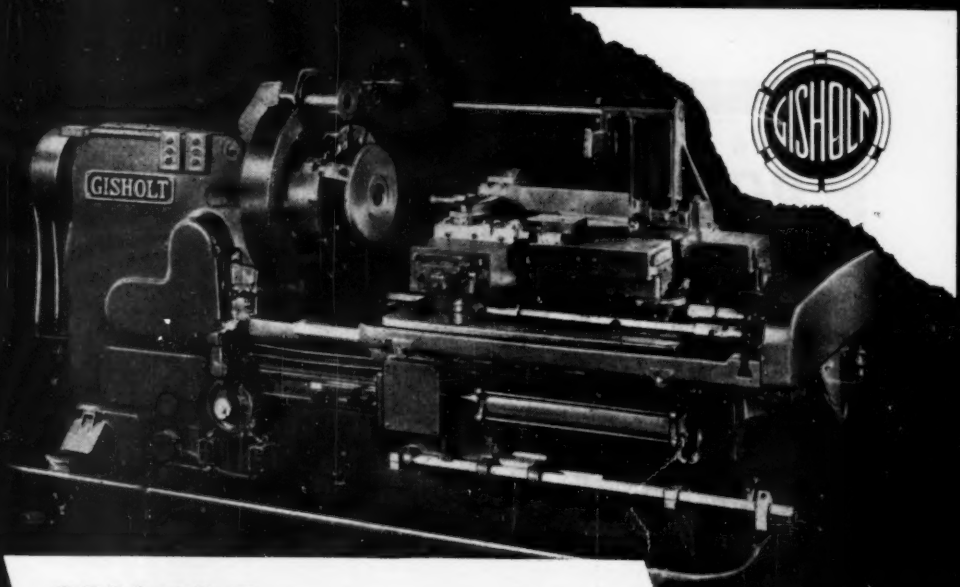
ARE WORKIN' TOOLS!

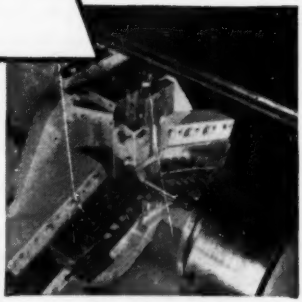


SIMPLE *is the word for the* SIMPLIMATIC!

Wherever you have a sufficient run of similar parts, the Simplimatic Automatic Lathe can solve several of your problems at once.

1. High speed production assures larger output at lower cost per piece.
2. The wide variety of tool arrangements on the large, flat table of the *Platen Type* Simplimatic (shown above) makes it adaptable to a wide range of work.
3. Training time is reduced to a minimum because the entire machining cycle is completely automatic. One operator normally runs several Simplimatics.

The extreme flexibility of the standard Simplimatic can frequently give you all the advantages of a machine designed especially for your job. If you want simple, quick, lower cost production, this is a good time to investigate the Gisholt Simplimatics. Ask for literature.



***The Radial Type* Simplimatic** is ideal for machining flywheels, etc., with wide faces and multiple inside and outside diameters. Extreme rigidity permits multiple tooling and maximum cutting speeds, sustained accuracy and excellent life of cutting tools.

THE GISHOLT ROUND TABLE
represents the collective experience of specialists in the machining, surface-finishing and balancing of round and partly round parts. Your problems are welcomed here.

GISHOLT MACHINE COMPANY
Madison 10, Wisconsin

TURRET LATHES · AUTOMATIC LATHES · SUPERFINISHERS · BALANCERS · SPECIAL MACHINES

this RODGERS PLATEN PRESS produces GRIDDLES at a sizzling rate!

Ever since they changed from a mechanical press to a Rodgers 100 ton Hydraulic Platen Press, Northland Aluminum Products of Minneapolis has reported they are not only pleased, but also surprised at the unusual results. No wonder! . . . production is up . . . product quality and finish is better . . . die wear is reduced . . . and die setup time is less. All these advantages are vitally important to Northland for they make a variety of products like Nordic Ware Aluminum Utensils, Griddle King Griddles and Steak Platters.

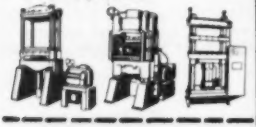
Although you may produce an entirely different line of products you probably would find a Standard Rodgers Platen Press would offer you the same advantages . . . whether your jobs are stamping, forming, drawing, coining, or die try-out . . . in metal or plastics.

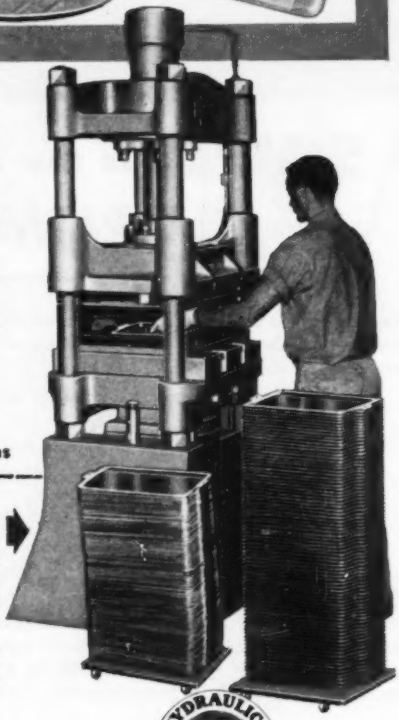
Write for the new Illustrated Rodgers Blue Ribbon Catalog

it gives complete details and specifications

RODGERS BLUE RIBBON PLATEN PRESSES FOR:

- Metal Drawing and Forming
- Plastic and Rubber Molding
- Die Try-Out General Assembly and Utility Work
- Capacities from 10 to 500 tons pressure





Here is the Rodgers 100 ton Hydraulic 24"x24" Platen Press which blanks and forms Northland Griddle Kings at the rate of 8 per minute. Aluminum is .153—finished size is 10¾" x17½".

Rodgers Hydraulic Inc.

7453 Walker St., Minneapolis 16, Minn.

Operator confidence soars—and so does production—with the Schrader Press Control. For this control is definitely a two-hand device. It is designed so that the hands that feed the die must also operate the press. Both hands must be used simultaneously for each operation and cannot stray into the danger zone when the ram comes down.

This *increased safety* of Schrader's Press Control lets operators build a worry-free rhythm that puts new speed in your presses.

Reduce Danger Here

What's more, Schrader Controls end the fatigue common with mechanical foot pedal operation—a Schrader-equipped press can be run as easily as a typewriter.

Wherever you have a power press—or any machine with a mechanical clutch—there's a chance to increase safety . . . boost operator confidence and thus increase production with a Schrader Control.

Let us help you decide what will best fit your needs. Write, describing the machines you plan to equip—or fill out the coupon below.

Schrader products
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control the air

Air Cylinders • Operating Valves • Press & Shear Controls • Air Ejection Sets • Blow Guns • Air Line Couplers • Air Hose & Fittings • Hose Reels • Pressure Regulators & Oilers • Air Strainers • Hydraulic Gauges • Uniflare Tube Fittings

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Please send me my free copy of Bulletin A280.

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AMES

...the *Preferred* Small Hole Gauge No. 36

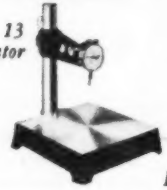
Skilled and unskilled employees can use this superbly designed two-point contact gauge to make quick, accurate, *impersonal* inspections of small holes for size, taper and roundness.

The spherical contact point automatically centers itself and indicates the true diameter at the point measured.

The Ames Small Hole Gauge No. 36 checks holes with 3/16" to 1" diameter, up to 2" deep. Longer lengths and special contacts to check irregular recesses, splines, available.

Ames No. 15 Jaw Gauge

Ames No. 13 Dial Comparator



Ames No. 516 Dial Micrometer

Ames No. 25 Pocket Thickness Measure

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INCREASES PRODUCTION...

LOWERS COSTS...

PAYS FOR ITSELF QUICKLY...

*The ROUSE HAND MILLER is a widely used, inexpensive, high speed, ball bearing, motor driven machine for handling light cuts in brass, aluminum, steel, plastics, and other materials—fast, accurately, and at very low cost. Only $110.00**

Fixtures (illustrated) extra.

*Motor equipment:—1/4 H.P. 110 Volt AC 60 cycle, single phase, swivel motor mount and light—$36.00**

**All prices FOB Chicago.*

★ **MILLS SMALL PARTS MUCH FASTER.**

★ **DRASTICALLY CUTS YOUR INVESTMENT IN EQUIPMENT.** Replaces expensive production machinery—or releases it for other jobs.

★ **INEXPERIENCED HELP CAN OPERATE IT.** Safe, simple, fool-proof operation.

★ **NO MORE COSTLY SET-UP TIME. $110.00*** price so low that it pays to keep one or more Hand Millers always set-up for special operations.

★ **YOU GET A BETTER PRODUCT**—the result of ABSOLUTE ACCURACY.

★ **A LOSS BECOMES A PROFIT** when marginal pieces are finished on the Hand Miller instead of on high cost equipment.

★ **VERY LOW MAINTENANCE.**

★ **USED REGULARLY IN 1163 MANUFACTURING PLANTS** (some of which use as many as 30 machines)—yet on the market a scant few years.

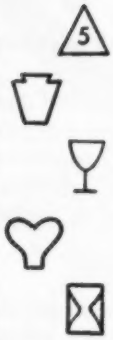
★ **UNIQUE—VERSATILE.** Nothing else like it. One or several machines can be the answer to some of *your* production problems.

Write today for further information.

H. B. ROUSE & COMPANY
2214 N. WAYNE AVE., CHICAGO 14
50 YEARS OF SERVICE TO INDUSTRY

RETAIN CONTROL

with INSPECTION and CODE STAMPS



These inspection and code stamps enable a manufacturer to retain control of his product wherever it goes. A single glance can provide such information as the identity of a welder, inspector, operator, or assembler—heat number, lot number, material or date of manufacture.

Choose your own code from any of 300 stock designs, available in any desired size, in either the economical HI-DUTY Brand or even longer-lasting HI-LOY Brand. You'll get permanent identification through use of code designs, with key letters or figures if desired.

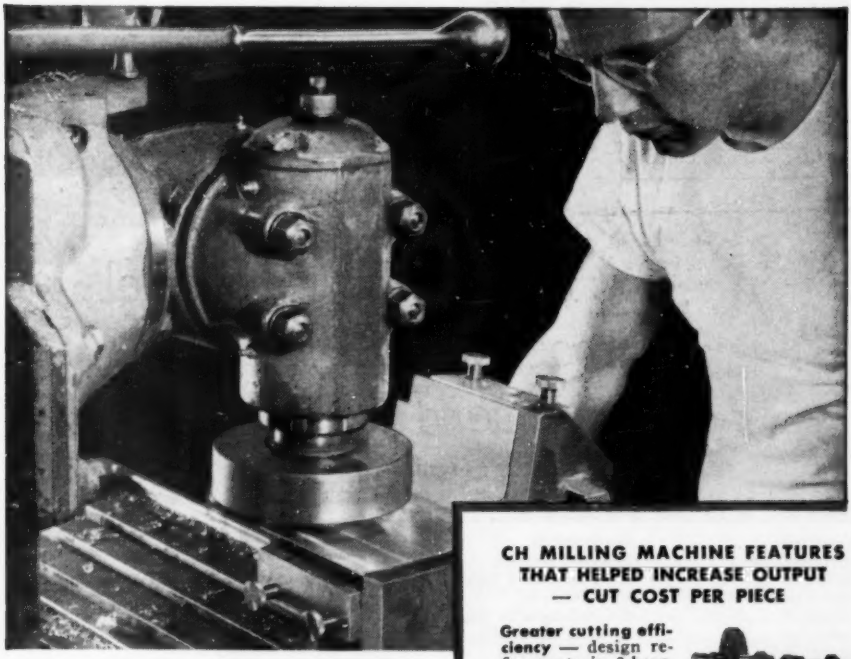
"IF IT'S WORTH MAKING, IT'S WORTH MARKING"

Geo. T. Schmidt marking engineers will help you develop a code control plan without obligation. Write for particulars.

GEO. T. SCHMIDT, INC.

1802 Belle Plaine Ave. Chicago 13, Ill.

5 MINUTES PER PIECE WITH THIS VERSATILE NEW CH MILLING MACHINE



Speeds fabrication of aircraft parts from 75ST aluminum alloy

HERE ARE THE FACTS ON THIS JOB:

Location: - MarVista Engineering Co., Los Angeles, Calif.
Machine: - 5 hp, No. 2, Model CH, Plain Style used with Universal Milling Attachment.
Part: - - Aircraft fitting for horizontal stabilizer.
Material: - - - - - 75ST aluminum alloy.
Cutter: - - - - One blade — 8" fly cutter.
Cutter Speed: - - - - 875 rpm. 9 ipm feed.
Depth of Cut: - - - - - - - - .050".
Production: - 12 pieces per hour — all sides milled.

Investigate the versatile new CH line of milling machines. Their features are job proven to give you cost-cutting results plus greater productivity, better finished products. Contact our nearest representative or write: Kearney & Trecker Corp., 6784 W. National Avenue, Milwaukee 14, Wis.

CH MILLING MACHINE FEATURES THAT HELPED INCREASE OUTPUT — CUT COST PER PIECE

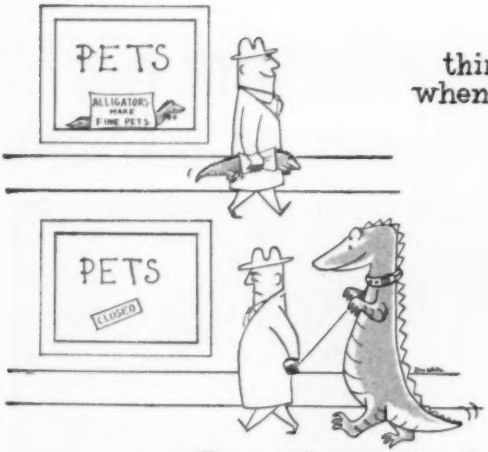
Greater cutting efficiency — design refinements in 3-bearing spindle, a heavy duty, special forged steel gear.

Smoother feed performance, heavy duty 2" dia. table feed screw. *23%* more bearing contact between screw nut.

Speed range — *16* changes from *25* to *1500* rpm. *Extra-wide feed range*— *16* changes from ¼ to *32* ipm.

KEARNEY & TRECKER MILWAUKEE MACHINE TOOLS

NOTE: This machine is available under Kearney & Trecker's TOOL LEASE program.



things to watch for
when buying alligators . . .

But if you're buying special purpose STEELS, may we recommend the **SPEED STEELS**

SPEED CASE — a low carbon free machining open hearth steel

SPEED TREAT — a medium carbon free machining open hearth steel

SPEED ALLOY — a chromium alloy steel

briefly they

- **are easy to heat-treat**
- **are fast machining**
- **give longer tool life**
- **produce better finishes**

THERE ARE SPEED STEEL SPECIALISTS IN . . .

Akron, Ohio	Burger Iron Co.
Bridgeport, Conn.	Bridgeport Steel Co.
Buffalo, N. Y.	Beals, McCarthy & Rogers
Cambridge (Boston), Mass.	Brown Wales Co.
Chicago, Ill.	W. J. Holliday & Co., Inc.
Dallas, Tex.	Earle M. Jorgensen Co.
Detroit, Mich.	Peninsular Steel Co.
Hammond, Ind.	W. J. Holliday & Co., Inc.
Houston, Tex.	Earle M. Jorgensen Co.
Indianapolis, Ind.	W. J. Holliday & Co., Inc.
Lewistown, Me.	Brown Wales Co.
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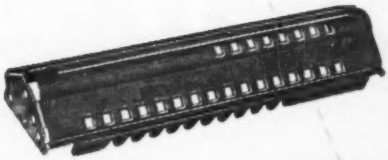
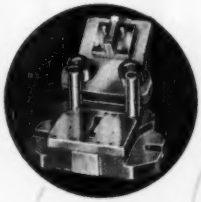
Speed steels are produced by W. J. Holliday & Co., Inc., Speed Steel Plate Division

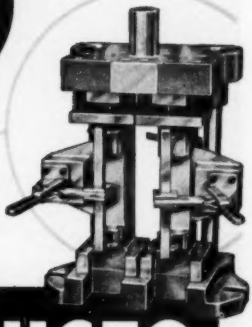
PRODUCTO *Catalog* DIE SETS

SOLVE SPECIAL STAMPING PROBLEM FOR MONROE



The Problem. Stamping end-plate holes in the carriage cover of the Monroe Adding Calculator.

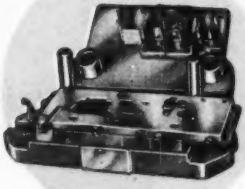




PRECISION

PRODUCTO

New design DIE SETS



THE DIE MANUFACTURER. The Connecticut Tool and Engineering Co., Bridgeport, Conn.

The lofty die, at right, represents the last critical stamping operation in the production of the Monroe carriage cover, shown above. It's unusual because it pierces close-tolerance end holes in either 10" or 12" covers *after* they have been assembled. The die set that controls this precise piercing operation both looks and performs like a "special" made-to-order set. Actually, it is a rear pin catalog set fitted with 1¼" x 16" pins. Even with the long guide pins, the highly accurate parallelism is maintained. Yes, Monroe is getting the benefit of a "special" without paying for extras in time and expense.

In all, 12 Producto catalog die sets are used in stamping and forming this assembly. Only the one with the long guide pins is unusual in size or shape but *all* require the utmost in precision and dependability. The point to remember is this: Whether you require a "made-to-order" special or a "quick-to-order" catalog die set, you'll get the *best* from Producto.

FOR PRECISION DIE SETS *FAST* CALL...

THE PRODUCTO MACHINE COMPANY • 960 Housatonic Ave., Bridgeport 1, Conn.

ALSO MAKERS OF DIE ACCESSORIES, FEEDING EQUIPMENT, VISES, MACHINERY.

Monarch

This Giant Thompson Grinder is one of nine working for The Monarch Machine Tool Company.

Through the years in increasing efficiency of their very fine lathes and in step with modern methods, Monarch has relied on the utility and precision of Thompson Grinders. Thompson is proud of this record of service and especially its ability to provide extreme precision grinding on this largest of all surface grinders.

INSTALLS WORLD'S LARGEST...

Surface Grinder

precision grinding lathe bedways up to 32 ft. long to a tolerance of five ten-thousandths of an inch .0005"

The precision of Thompson Way Grinders is exemplified in this giant new machine recently installed in the plant of the Monarch Machine Tool Company of Sidney, Ohio. Monarch lathes are known the world over for their extreme efficiency and accuracy, therefore, in the machining of the bedways of their longest machines they had to depend on grinding equipment that maintained exceptional accuracy over entire surfaces up to 32 feet in length. This accuracy is perfectly maintained on this Thompson Way Grinder to five ten-thousands of an inch.

Thus, this surface grinder is not only the World's largest but size for size, one of the World's most accurate machines. The overall length is 79 feet and it measures 13 feet high and 13½ feet wide. Yet in spite of its size all operations are easily controlled by a single operator automatically from the convenient suspended push button control panel. This is typical of Thompson centralized control available with all types and sizes of Thompson Grinders. It will pay you to consult Thompson Engineers in finding an economical solution to *your* problems.

Have Thompson Engineers solve your grinding problems

THE THOMPSON GRINDER COMPANY
Springfield, Ohio

Thompson Grinders

Sid Tool Company

WHY WAIT FOR SPECIAL DRILLS?

. . . Has them IN STOCK for IMMEDIATE DELIVERY!

Extra Long Length High Speed Drills—Straight Shank

TAPER LENGTH WIRE GAUGE SIZES

Wire Gauge Nos.	Price Each	Length Overall Inches	Approx. Length of Twist Inches	Wire Gauge Nos.	Price Each	Length Overall Inches	Approx. Length of Twist Inches
1	$1.00	6 1/8	3 3/4	31	.70	5 1/8	3
2	1.00	6 1/8	3 3/4	32	.70	5 1/8	3
3	1.00	6	3 5/8	33	.70	5 1/8	3
4	1.00	6	3 5/8	34	.70	5 1/8	3
5	1.00	6	3 5/8	35	.70	5 1/8	3
6	1.00	6	3 5/8	36	.70	4 5/8	2 1/2
7	1.00	6	3 5/8	37	.70	4 5/8	2 1/2
8	1.00	6	3 5/8	38	.70	4 5/8	2 1/2
9	1.00	6	3 5/8	39	.70	4 5/8	2 1/2
10	1.00	6	3 5/8	40	.70	4 5/8	2 1/2
11	.90	6	3 5/8	41	.60	4 5/8	2 1/2
12	.90	6	3 5/8	42	.60	4 1/4	2 1/4
13	.90	5 3/4	3 1/2	43	.60	4 1/4	2 1/4
14	.90	5 3/4	3 1/2	44	.60	4 1/4	2 1/4
15	.90	5 3/4	3 1/2	45	.60	4 1/4	2 1/4
16	.90	5 3/4	3 1/2	46	.60	4 1/4	2 1/4
17	.90	5 3/4	3 1/2	47	.60	4 1/4	2 1/4
18	.90	5 3/4	3 1/2	48	.60	3 3/4	2
19	.90	5 3/4	3 1/2	49	.60	3 3/4	2
20	.90	5 3/4	3 1/2	50	.60	3 3/4	2
21	.80	5 3/4	3 1/2	51	.50	3 3/4	2
22	.80	5 3/4	3 1/2	52	.50	3 3/4	2
23	.80	5 3/8	3 1/4	53	.50	3	1 3/4
24	.80	5 3/8	3 1/4	54	.50	3	1 3/4
25	.80	5 3/8	3 1/4	55	.50	3	1 3/4
26	.80	5 3/8	3 1/4	56	.50	2 1/4	1 1/8
27	.80	5 3/8	3 1/4	57	.50	2 1/4	1 1/8
28	.80	5 3/8	3 1/4	58	.50	2 1/4	1 1/8
29	.80	5 3/8	3 1/4	59	.50	2 1/4	1 1/8
30	.80	5 3/8	3 1/4	60	.50	2 1/4	1 1/8

S Set $1—1 ea. $1-60 Long Drills. Consists of 60 Drills $40.00
E Set $2—1 ea. Letter A-Z Long Drills. Consists of 26 Drills 40.00
T Set $4—1 ea. 1/8 to 1/2 Extra Long Drills. 12" Overall,
S 9" Flute. Consists of 25 Drills x 64ths 55.00

STRAIGHT SHANK
12" LONG 9" FLUTE

Size Inches	Price Each Net	Size Inches	Price Each Net
1/8	$1.65	5/16	2.25
9/64	1.65	21/64	2.50
5/32	1.65	11/32	2.50
11/64	1.65	23/64	2.75
3/16	1.65	3/8	2.75
13/64	1.80	25/64	3.05
7/32	1.80	13/32	3.05
15/64	1.95	27/64	3.30
1/4	1.95	7/16	3.30
17/64	2.05	29/64	3.60
9/32	2.05	15/32	3.60
19/64	2.25	31/64	3.60
		1/2	3.60

15" LONG 12" FLUTE

17/32	$7.00	21/32	9.00
9/16	7.70	11/16	9.10
19/32	8.25	23/32	9.35
5/8	8.80	3/4	9.50

Taper Length Letter Sizes
STRAIGHT SHANK

Size	Price Each	Length Overall Inches	Approx. Length of Twist Inches
A-E	$1.64	6 1/8	4
F-K	1.71	6 1/4	4
L-N	1.78	6 3/8	4 1/8
O-R	1.86	6 1/2	4 1/8
S-U	2.00	6 3/4	4 1/4
V-Y	2.14	7	4 3/8
Z	2.29	7 1/4	4 5/8

TAPER SHANK

Size	Price Each	Length Inches	Twist Inches	Shank Size	Size	Price Each	Length Inches	Twist Inches	Shank Size
33/64	$7.15	17	13	No. 2 M.T.	47/64	$ 9.50	17	13	No. 2 M.T.
17/32	7.15	17	13	No. 2 M.T.	3/4	9.50	17	13	No. 2 M.T.
35/64	7.70	17	13	No. 2 M.T.	25/32	10.20	17	13	No. 2 M.T.
9/16	7.70	17	13	No. 2 M.T.	13/16	12.00	18	13 3/8	No. 3 M.T.
37/64	8.25	17	13	No. 2 M.T.	27/32	12.50	18	13 3/8	No. 3 M.T.
19/32	8.25	17	13	No. 2 M.T.	7/8	13.20	18	13 3/8	No. 3 M.T.
39/64	8.80	17	13	No. 2 M.T.	29/32	13.75	18	13 3/8	No. 3 M.T.
5/8	8.80	17	13	No. 2 M.T.	15/16	14.30	18	13 3/8	No. 3 M.T.
41/64	9.00	17	13	No. 2 M.T.	31/32	15.40	18	13 3/8	No. 3 M.T.
21/32	9.00	17	13	No. 2 M.T.	1	17.60	20 1/2	15 7/8	No. 3 M.T.
43/64	9.10	17	13	No. 2 M.T.	1-1/16	18.70	20 1/2	15 7/8	No. 3 M.T.
11/16	9.10	17	13	No. 2 M.T.	1-1/8	19.80	21 1/2	15 7/8	No. 4 M.T.
45/64	9.35	17	13	No. 2 M.T.	1-3/16	22.00	21 1/2	15 7/8	No. 4 M.T.
23/32	9.35	17	13	No. 2 M.T.	1-1/4	24.00	21 1/2	15 7/8	No. 4 M.T.

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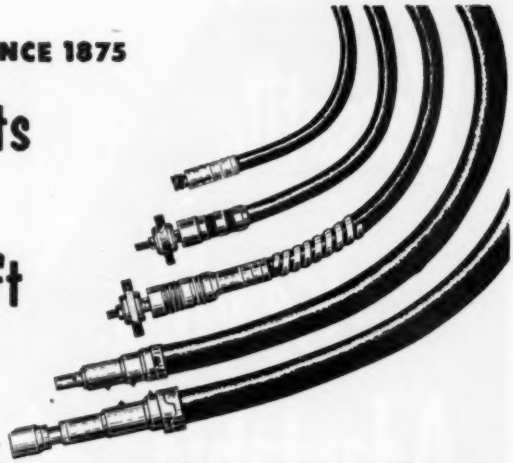

JT 38—Jiffy Tool. Constant speed machine.

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4. **STANDARD** power drive shafts available.
5. **FOUR STANDARD** types of cases. Special cases can be furnished to meet your requirements.
6. **LARGE VARIETY** of standard terminal parts available.
7. **SPECIAL** terminal parts can be made to your specifications.
8. **ENGINEERING SERVICE**—Your inquiry will receive prompt and careful consideration by TOP flexible shaft engineers.

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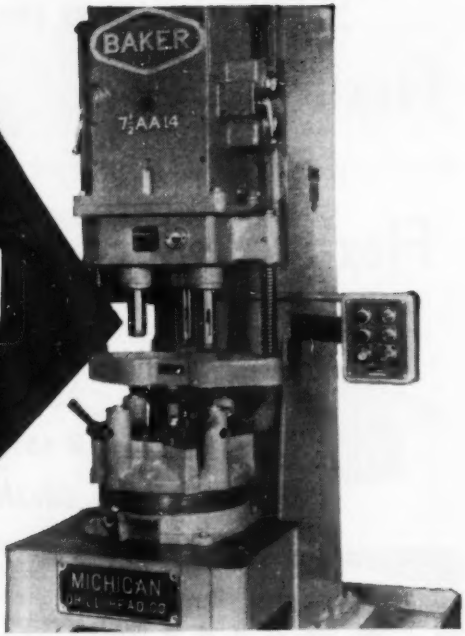

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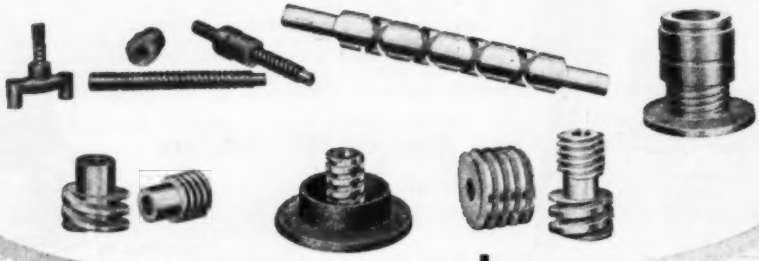

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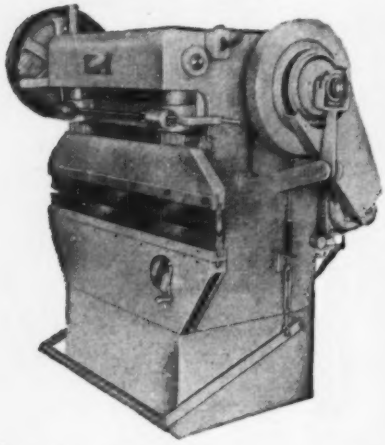

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21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140

Please Print

Company .....

Name ..... Position .....

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Please send information on the products or services mentioned or advertised on the following pages: ....

....

Please send information on NEW PRODUCTS described on the following pages:

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Please Print

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City ..... Zone ..... State .....

NEW PLASTIC TAP BOXES

COMPLETE LINE OF STANDARD & SPECIAL TAPS

PROTECTED QUALITY

It's apparent how Threadwell TAP quality is protected by the original plastic tap package shown above. BUT . . . the quality of ALL Threadwell products is ***triple protected.*** At the ***factory*** by rigid process and individual final inspection . . . in ***transit and storage*** by advanced packaging and clear labeling . . . and in ***use*** by Threadwell Field Engineers strategically located nation wide to help you with cutting tool and gaging problems on the job.

ADJUSTABLE ROUND, 2-PIECE & HEXAGON DIES

KEYWAY BROACHES & SETS

COMPLETE LINE OF HIGHEST PRECISION GAGES

THREADWELL DISTRIBUTORS, too, are strategically located to serve you promptly, properly, and well.

THE FINEST IN CUTTING TOOLS & GAGES

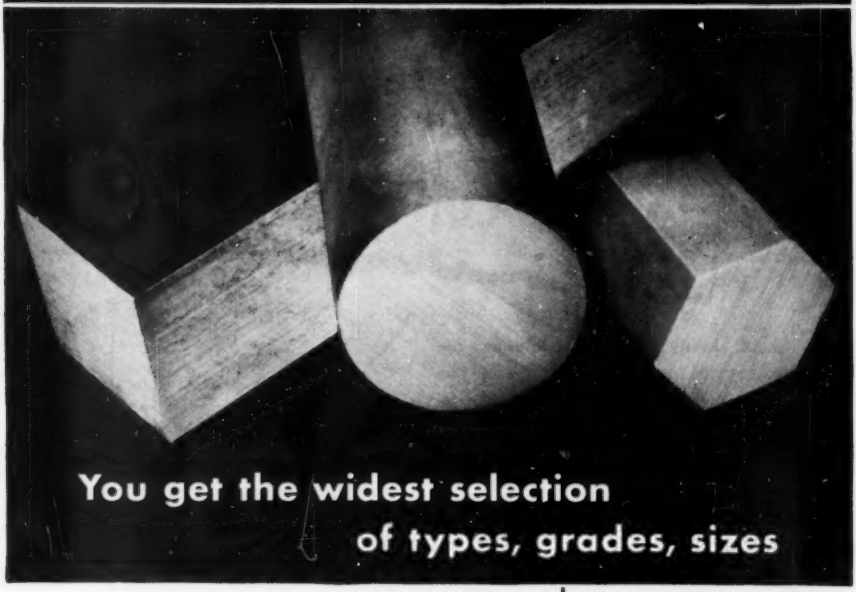
Johnson Bearings in standard, stock sizes are available through your local Johnson Distributor. He will save you delays because he stocks a wide range of sizes of Johnson Sleeve Bearings and Bronze Bars. He saves you machining time because Johnson Bearings will fit over 90% of your sleeve bearing needs. He saves you money because he can furnish you low cost, standard, stock size Johnson Bearings at much less than made-to-order bearings.

JOHNSON BRONZE COMPANY
615 South Mill Street · New Castle, Pa.

JOHNSON JB BEARINGS
Sleeve Type

Write for the Johnson Bearing Catalog

WHY IT PAYS TO BUY STAINLESS BARS FROM US



• You can greatly simplify your buying of stainless steel bars by calling the nearest U. S. Steel Supply warehouse. Our warehouses offer you the widest selection of top quality bars ready for immediate delivery. These bars are made from USS Stainless Steel—produced under the strictest quality control from ore to finished product—so you're sure of getting the exact grade you specify.

In addition our large stocks provide greater design freedom for your particular needs. And our experienced stainless men are at your disposal to help you select the best grade for the job . . . and even to help you with design problems.

Call us for USS Stainless bars—rounds, squares, hexagons, angles, channels—and for stainless sheets and strip, too.

U. S. STEEL SUPPLY
DIVISION

General Offices: **208 So. La SalleSt., Chicago 4, Ill.**
Warehouses and Sales Offices Coast to Coast

UNITED STATES STEEL

TRIPLE SECURITY

What you want
When you want it
At the right price

SEND FOR FREE LITERATURE

U. S. Steel Supply
208 So. La Salle St., Chicago 4, Ill.
Gentlemen:

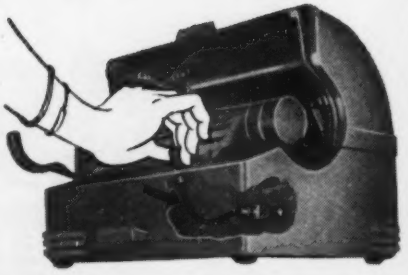
Please send me, without obligation, literature on your Stainless Steel stocks and service.

Name.....
Company.....
Address.....
City.....State.....

COST-SAVING IDEAS FOR DESIGN ENGINEERS

MANUFACTURER FINDS S.S.WHITE FLEXIBLE SHAFT A LOW COST SOLUTION TO KNOTTY CONTROL PROBLEM

A small, easily installed S.S.White remote control flexible shaft allowed the manufacturer of this voice transcriber to mount the speed control knob at right angles to the governor speed shaft. *Result:* an improved design, easier assembly and —as the manufacturer puts it—"feather-touch" control.



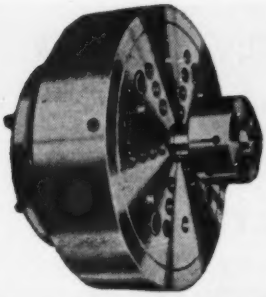
COULD THIS BE YOU?

You can probably realize similar savings and improvements in your own equipment by using flexible shafts to transmit power or to provide remote control. Why not send in your problem to us and let our engineers make recommendations? There's no obligation.

BULLETIN 5306 has basic information and data on flexible shaft application and selection. Send for a free copy. Address Dept. H.

THE S.S.White INDUSTRIAL DIVISION
DENTAL MFG. CO.
10 East 40th Street
NEW YORK 16, N. Y.

Western District Office • Times Building, Long Beach, California

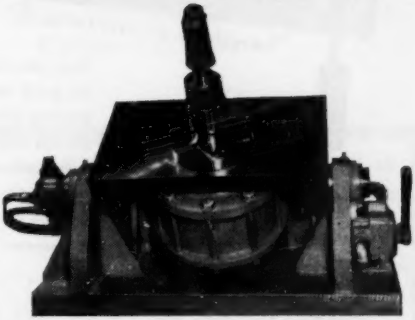


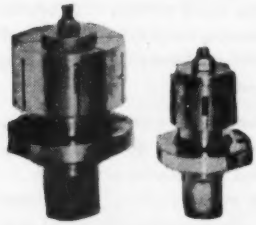
CHUCKS

Parts that can be chucked internally can be chucked faster and machined more accurately on SPEEDGRIP Precision Internal Chucks than by external chucking methods. Standard SPEEDGRIP CHUCKS are made in various sizes. They cover a range of bores from one half inch to eleven inches and can usually be purchased right from stock. SPEEDGRIP engineers are at your service to design and build any standard or special chucking equipment you may require.

FIXTURES

SPEEDGRIP fixtures are designed and built for use on single or multiple spindle boring machines; milling machines; drill presses, etc. At the right is shown a tilting type fixture that is used on a No. 150 Baker Drill. Two air cylinders are used for tilting and clamping the work. SPEEDGRIP fixtures hold workparts securely, position them accurately and usually reduce loading and unloading time.





MANDRELS

All SPEEDGRIP Mandrels are made from high grade Alloy Steel, heat treated and ground to precision gages Standard Mandrels are made in ten different nose sizes and use the same bushings as standard chucks. SPEEDGRIP engineers also design and build many special mandrels and welcome an opportunity to help solve your internal chucking problems where special equipment is required.

SPEEDGRIP CHUCK
820 NORTH WARD STREET
ELKHART, INDIANA

JIG GRINDING ACCURACY *guaranteed**

EASILY CONNECT

this jig grinder to jig borer or mill (The "Vulcanaire" has infinite controlled speeds 30,000 to 65,000 R. P. M.)

*Dependably accurate to "tenths"

Then you can finish grind in hardened steel to "tenths" . . . jig grind dowel holes square with a ground base . . . move location of holes in hardened steel blocks . . . jig grind interchangeable holes in hardened sections . . . grind small holes with diamond impregnated mandrels . . . grind contours and relief with tungsten carbide burrs . . . grind radii in die sections . . . eliminate jig bushings in tools where close spacing is essential.

For immediate quotation please state machine tool application. Get this manual of photos showing operations Vulcanaire performs. *Dependably accurate to "tenths"

Other infinitely controlled air driven spindle applications

Place spindle on most any machine. Use it for finishing contours on hardened steel working surfaces . . . burring or milling die castings . . . routing wood contours . . . carbide milling or finishing slots . . . finishing holes in hardened steel to "tenths" . . . grinding with diamond wheels, carbide burrs, or diamond impregnated mandrels.

Advantages—10 micro finishes using carbide mills . . . 6 micro finishes using mounted points, operates at any angle . . . air driven, air cooled, overheating prevented . . . speed controlled at optimum point . . . 3⅝" long motor uses little working space . . . By controlling speed at any point you abolish need for many constant speed spindles.

Vulcanaire

It's built by toolmakers for toolmakers

MAJOR VULCAN SERVICES

Engineering, Processing, Designing and Building, Special Tools, Dies, Special Machines including the Vulcan Hydraulics that Form, Pierce, Assemble and Size.

VULCAN TOOL CO., Highland & Lorain DAYTON 10, OHIO

The Geargrind Universal Oscillating Grinder will perform a wide range of grinding operations. Its initial cost is much lower than would be expected for a grinder with so many specialized uses.

Now...For toolroom or production work—a really versatile and rugged universal grinder

The Geargrind Universal Oscillating Grinder for Fine Finishing of Spherical–Conical–Cylindrical Surfaces

Whether you need tool room accuracy or production economy, you'll save time and money with the versatile Geargrind Universal Oscillating Grinder.

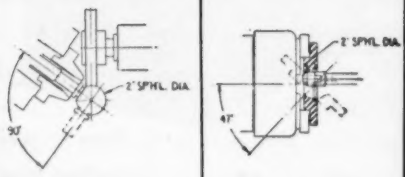
With its various simplified attachments, it is designed to perform *all* of these precision grinding jobs:

- internal and external cylindrical surfaces
- generated or formed spherical internal and external surfaces
- external conical surfaces
- internal tapers
- ball bearing races and fillets

YOU'LL WANT ALL THE FACTS

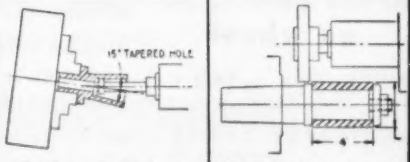
We have prepared a comprehensive 6-page catalog on all the information and specifications of this unique grinder. Please write—we'll be happy to send it to you, along with a quotation of Geargrind's new low prices.

Typical examples of work performed on the Geargrind Universal Precision Grinder



Ball stud, alloy steel, carburized and hardened. Held in a collet.

Flanged ball socket, cast iron. Held in a diaphragm chuck.



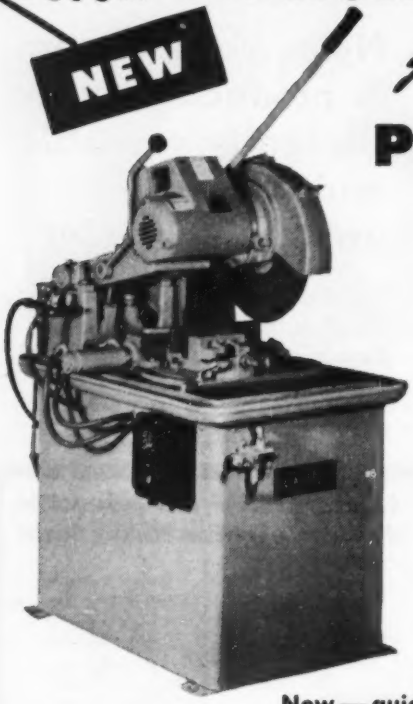
Grinding wheel adapter. Grinding the tapered hole. Held in a precision 4-jaw chuck.

External cylindrical grinding.

GEARGRIND Detroit

THE GEAR GRINDING MACHINE CO.
3931 Christopher
Detroit 11, Michigan

NEW



Automatic

POWER-FED

Cutting Head

for STONE Model M-75

ONE SIMPLE LEVER FOR AUTOMATIC CUTTING

You Save up to 25% on wheel costs with power feed!

Now — quicker — safer — cutting with controlled feeds, gives even greater efficiency to Stone High-Speed cutting equipment. The automatic feed improves the quality of cut, eliminates operator fatigue, increases production rates and increases wheel life.

AVAILABLE AS OPTIONAL EQUIPMENT ON NEW MACHINES OR AS SEPARATE UNIT FOR INSTALLATION ON PRESENT MACHINES.

Write Today For Complete Information

STONE MACHINERY CO., INC.

Fayette St. Manlius, N.Y.

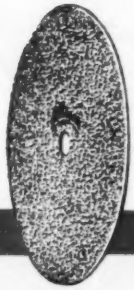
No need to hold back any longer . . .

Adequate Titanium Supply Assured by Aircraft Production Resources Agency

January, 1954, Bulletin:
"It is evident that there will be more assurance of an adequate supply to meet most planned production programs in 1954."

Titanium
IS RARIN' TO GO!

. . . and the cutting of Titanium is no longer a problem, either. Allison abrasive cutting wheels can speed your company on its way to finding new uses for this wonder metal. Tests prove that abrasive cutting is *the only efficient and economical method* for cutting Titanium, as well as many of the tough "new" high-temperature-resistant alloys.



The cutting of Titanium with Allison abrasive wheels is comparable in speed, quality and economy with that of cutting most grades of steel.

Tough Cut-Off Jobs Are Easy . . . with Allison.

The *best* way to cut many materials . . . the *only* way to cut some.

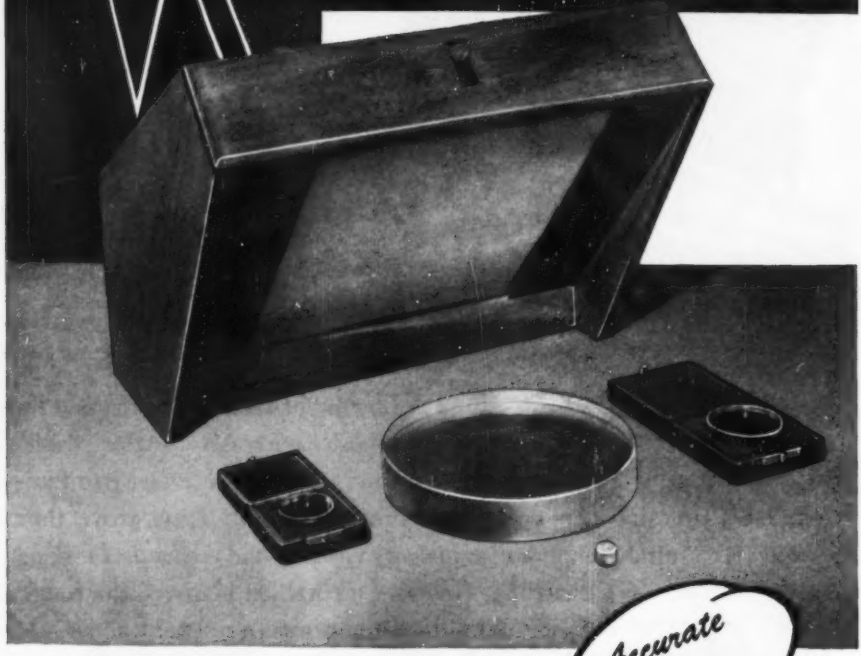
Allison ABRASIVE CUTTING WHEELS

THE ALLISON CO., 264 ISLAND BROOK AVENUE, BRIDGEPORT 8, CONN.

2ALS4B

fused quartz

VK OPTICAL FLATS



Accurate to .000001"

With VK Optical Flats, close checking of flat surfaces is simplified and more conveniently handled.

Shown here is the new Van Keuren monochromatic light, 22¼" wide, 17¼" high and 20" deep (in bench space). It is designed for use with large optical flats such as the one shown—a 10" diameter fused quartz double-surface master flat (accurate to .000001" both sides).

VK Optical Flats are available in sizes from ½" diameter to 10" diameter in .000001", .000002", or .000004" accuracy. They can be shipped within 30 days from order.

Catalog and Handbook No. 35 is available by writing: The Van Keuren Co., 177 Waltham St., Watertown, Mass. Ask for your copy.

VK

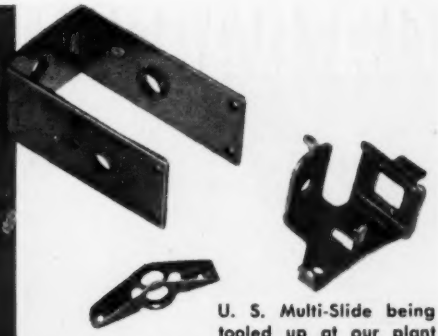
35th YEAR

THE *Van Keuren* CO.,

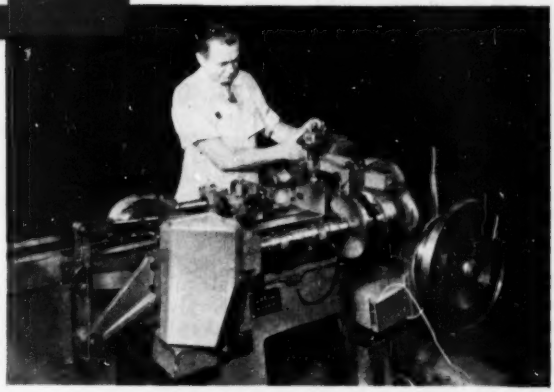
177 WALTHAM STREET, WATERTOWN, MASS.

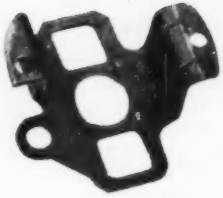
Light Wave Equipment • Light Wave Micrometers • Gage Blocks • Taper Insert Plug Gages • Wire Type Plug Gages • Measuring Wires • Thread Measuring Wires • Gear Measuring System • Shop Triangles • Carboloy Cemented Carbide Plug Gages • Carboloy Cemented Carbide Measuring Wires • Chrome Carbide Taper Insert Plug Gages

YOU CAN PRODUCE PARTS LIKE THESE ON THE U.S. MULTI-SLIDE



U. S. Multi-Slide being tooled up at our plant prior to shipment.





Bulletin 15-B contains complete specifications for all four sizes of U.S. Multi-Slide Machines. Ask for a copy.

These parts were tooled for production on U. S. Multi-Slide (R) machines by the General Tool and Engineering Company, Dayton, Ohio. They are produced complete — without secondary handlings — at profitable high production rates. The feed unit, ram, forming slides and vertical stripper (which are standard Multi-Slide equipment) make it possible to produce complicated parts to close tolerances at each stroke of the machine. The U. S. Multi-Slide may be tooled up to perform trimming, piercing, shearing, embossing, swaging and forming operations in a great variety of combinations. If you are making precision formed stampings, find out how U. S. Multi-Slides can help reduce labor costs, increase production and improve quality.

U.S. TOOL COMPANY, Inc.

AMPERE (East Orange) NEW JERSEY

Builders of U. S. Multi-Slides — U. S. Multi-Millers

U. S. Automatic Press Room Equipment — U. S. Die Sets and Accessories

FLAT LAPPING OF METALS

A view of our experimental lapping laboratory. In 1953 we proved to over 200 manufacturers that lapping was profitable and solved their problems.

Our lapping laboratory is also equipped with the finest checking instruments to insure an accurate report of every experimental job.

How to find out if you need . .

Precision Flatness, Finish and Parallelity in Production Quantities

and how to get it

Over 500 manufacturers of industrial equipment including pumps, compressors, valves and controls plus many of the largest automotive and aircraft plants have found production lapping a great time and money saver in their operations. In many cases gaskets between mating surfaces have been eliminated, while in others a closer tolerance has brought about a tremendous improvement in product performance. The extreme high production accuracy of the Lapmaster (Micro-inch finishes of 2 to 3 RMS—surface flatness to less than .000011" when required) have amazed and sold many production men. This accuracy has been definitely proven on practically all materials including cast iron, steel, stainless steel, aluminum, brass, carbon, ceramics, plastics and sintered metals.

Our Lapping Laboratory Is At Your Service

There is one sure way to find out if lapping is practical and profitable for you with no strings attached. We invite you to send us a few sample parts including surface finish specifications and approximate production requirements. The parts will be lapped in our laboratory shown above and returned to you with complete facts including data on number of finished parts per hour and recommended Lapmaster size to do the work. Many companies, large and small, have already taken advantage of this free service. In a majority of cases the Lapmaster has proven its use. Why not find our for *yourself* today.

Crane Packing Co., Dept. BB-7, 1812 Cuyler Ave., Chicago 13, Ill.
In Canada: Crane Packing Co., Ltd., 617 Parkdale Ave., N., Hamilton, Ont.

Protected by U.S. and Foreign Patents

Additional Data
on the Lapmaster is available on request, also new information on Measuring Flatness. Write for your copies today.

JOHN CRANE

CRANE PACKING COMPANY

DRILL-SPOT FACE-COUNTERSINK-REAM-TAP

20
individual operations

...on one Part
...on one Machine
...in ten Seconds!

...that's precision production on a **Morris**
MOR-SPEED Machine

a better product at less cost with precision

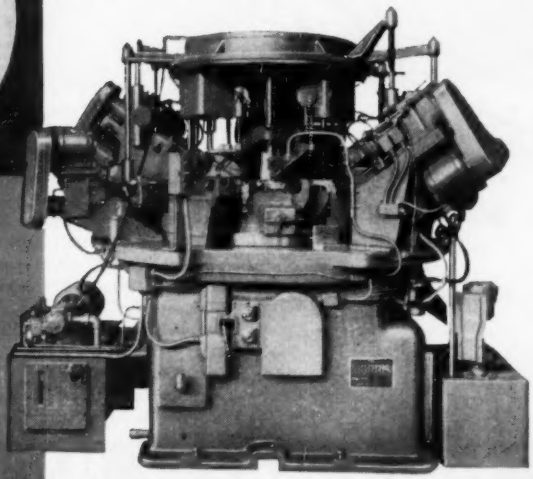
It's easy to say "the way to higher production and lower costs lies in special machinery." The sky-high price and limited application of a "special" often makes this solution impractical.

But Morris Engineers have developed a time-tested method for delivering precision production at lowest cost . . *without* a staggering investment. Morris MOR-SPEED Machines combine *standard* machine units in a special design that offers all the advantages of "special machinery" without the big price tag.

The machine illustrated is a good example: standard base, standard indexing table, standard center column, standard straight and angular drilling heads, standard coolant and hydraulic units plus a minimum of special tooling. The result is "special" machine production at a very special, low cost.

Your drilling, tapping, reaming and similar operations may be adaptable to a MOR-SPEED solution. It costs you nothing to find out!

Write today for complete details.



THE MORRIS MACHINE TOOL CO.
937 Harriet St., Cincinnati 3, Ohio

16 years . . .

. . . . . 20,000 Bridgeports

. . . a record of acceptance from 1938 to 1954

On August 8th, 1938, 16 years ago, the first BRIDGEPORT TURRET MILLING MACHINE left our old plant for the Precision Die Casting Co., at Syracuse, N.Y.

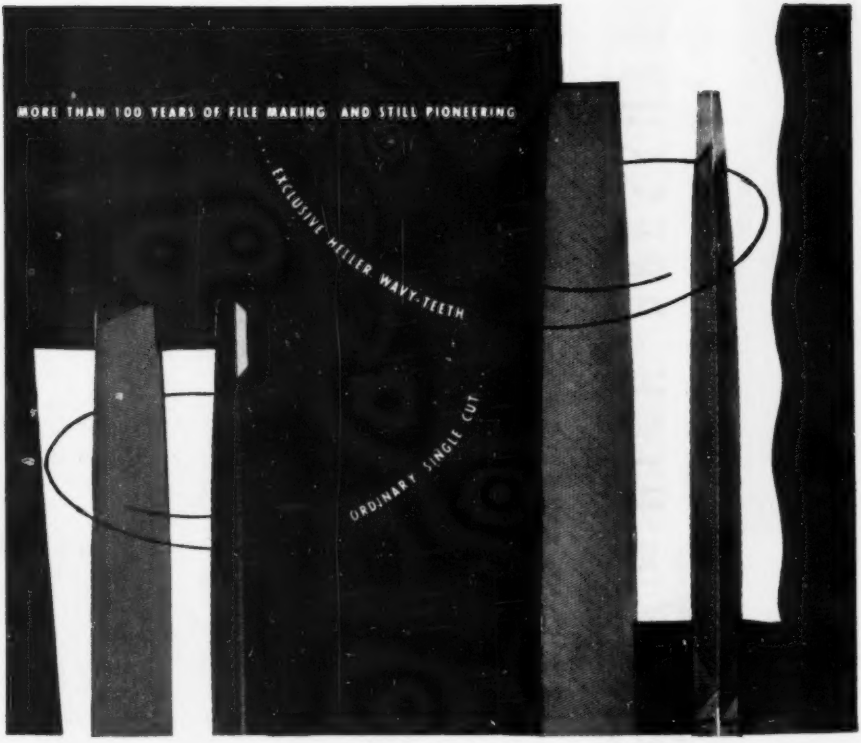
Judging from the number of milling machines produced up to that time, the Toolmaker and the Patternmaker shown here with the 20,000th machine were most optimistic when they had hopes they might be able to sell 5,000 of these machine before the market was saturated.

Either the judgment of these two men was very bad or the machine they had developed was awfully good, because the 20,000th machine left our new, modern plant on March 18th consigned to the Pioneer Electric & Research Corporation, Forest Park, Illinois . . . and every 45 minutes of a 50-hour week, another "Bridgeport" goes forward to an impatiently waiting customer. Rest assured we shall always do our best to merit your continued confidence in the "Bridgeport" as expressed in its outstanding record of acceptance.

Bridgeport MACHINES, INC.

Bridgeport, Connecticut

Manufacturers of High Speed Milling Attachments and Turret Milling Machines



HELLER WAS *FIRST* WITH WAVY-TEETH MILL AND SAW FILES

You can remove more metal faster when you use Wavy-Teeth mill or saw files instead of ordinary single cut mill or saw files. Always specify "Wavy-Teeth" to get this exclusive Heller tooth arrangement . . . a typical development of Heller research. Through a continuous program of inspecting, testing and improving, Heller guarantees file users "the best."

other Heller *Firsts*

SPIRAL-CUT Half Round Files
NUCUT Wavy-Teeth Files
VIXEN Milled Curved Tooth Files

*Registered T.M.

VIXEN
American-Swiss
NUCUT

THESE 3 FAMOUS BRANDS ARE MADE ONLY BY

HELLER BROTHERS SINCE 1836

HELLER BROTHERS CO. *America's Oldest File Manufacturer* **NEWCOMERSTOWN, OHIO**

YOUR *HELLER* DISTRIBUTOR CAN SUPPLY ALL YOUR FILE NEEDS

Miller

HIGH PRESSURE
HYDRAULIC CYLINDERS

"Stock" Models for Immediate Delivery
Added To Famous "Custom-Built" Line

Miller "Custom-Built" Cylinders are available on normal delivery in an *almost infinite selection.*

Identical-quality "Stock" Cylinders are available for *immediate delivery* in these popular sizes . . .

NON-CUSHIONED: 1½", 2½" and 4" bore sizes each available in 2", 4", 6", 8", and 11" strokes. CUSHIONED BOTH ENDS: 2", and 3¼" bore sizes each available in 3", 5", 7", 9", and 13" strokes.

"Stock" Cylinders are basic Model H53 with foot, flange and pivot mounting attachments available as desired.

NOTE: *"Stock" Miller Air Cylinders also available!*

Write for Complete Stock List

DIRT WIPER SEALS

Protect Rods, Seals, Bushings

Standard Leather Cup Seal Assembly Shown Is Interchangeable With Miller Standard Piston Ring Piston Assembly

WRITE FOR CYLINDER BULLETINS H-104 and A-105

Complete Miller cylinder line includes: air cylinders, 1½" to 20" bores, 200 PSI operation; low pressure hydraulic cylinders, 1½" to 6" bores for 500 PSI operation, 8" to 14" bores for 250 PSI; high pressure hydraulic cylinders, 1½" to 12" bores, 2000-3000 PSI operation. All mounting styles available.

MET J. I. C. HYDRAULIC STANDARDS years before their adoption in 1949.

SPACE-SAVING SQUARE DESIGN originated by Miller in 1945.

SALES AND SERVICE FROM COAST TO COAST

CLEVELAND • YOUNGSTOWN • DAYTON • PITTSBURGH • PHILADELPHIA • BOSTON • HARTFORD • NEW YORK CITY • BUFFALO • ST. PAUL • GRAND RAPIDS • DETROIT • FLINT • FORT WAYNE • SOUTH BEND • INDIANAPOLIS • MILWAUKEE • LOUISVILLE • KANSAS CITY • SEATTLE • LOS ANGELES • SAN FRANCISCO • BALTIMORE • DENVER • ST. LOUIS • MOLINE • CHICAGO • HOUSTON • TORONTO, CANADA and OTHER AREAS

Miller

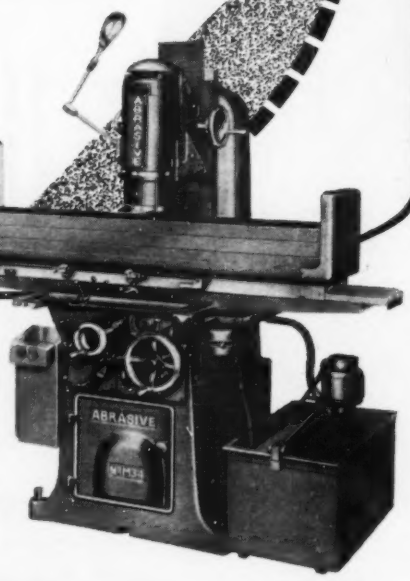
MILLER FLUID POWER CO.

(Formerly MILLER MOTOR COMPANY)

2026 N. Hawthorne Ave., Melrose Park, Ill.

AIR & HYDRAULIC CYLINDERS • BOOSTERS • ACCUMULATORS
COUNTERBALANCE CYLINDERS

Grind Flat Surfaces FAST

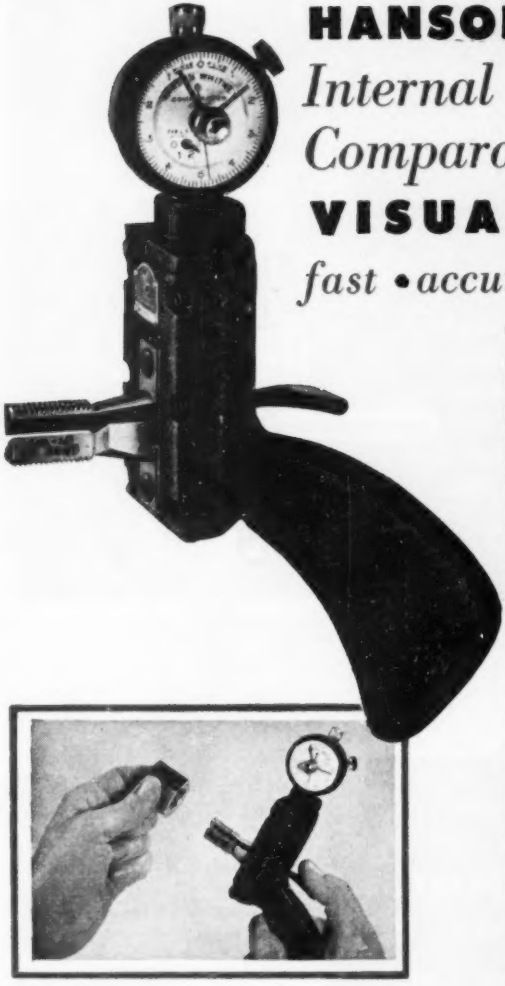


The Abrasive No. M34 Vertical Spindle Surface Grinder puts the face of a 6" segmental grinding wheel to work — grinds pieces up to 4" wide by 24" long in a single pass. This grinder is up to 400% faster than a comparable horizontal spindle machine . . . its 5 h.p. motorized spindle brings parts down to size fast and economically. Work capacity is 24" longitudinal, 8" transverse, 12" vertical . . . the only grinder in this capacity range with a vertical spindle. For complete details, write for Abrasive No. M34 Catalog *today*. Abrasive Machine Tool Company, 14 Dunellen Road, East Providence 14, Rhode Island.

ABRASIVE
ACCURACY BOOSTS PRODUCTION

Abrasive Quality is Reflected in the Finish of Your Product

NOW... *a new addition to the famous* **HANSON** *processes*



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Internal Thread Comparator for
VISUAL GAGING
fast • accurate • economical

This new Hanson-Whitney Internal Thread Comparator provides fast, accurate, economical, visual gaging of all forms and classes of internal threads in diameters ranging from $\frac{3}{8}$" to $1\frac{1}{2}$". Thread segments are quickly interchangeable for inspecting other types, sizes and forms of threads. Accumulated errors of lead and pitch diameter can be analyzed by using the H-W Comparator with special two-thread segments.

Recognized Hanson standards of quality are embodied in the new H-W Internal Thread Comparator. All movable parts are hardened, ground and lapped to precision tolerances—thread segments will outlast several plugs. Exclusive actuating principle insures long-life accuracy.

Your nearest Hanson-Whitney representative will gladly show you how to reduce your gaging costs with the new Hanson-Whitney Internal Thread Comparator.

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Division of Whitney Chain Company, Hartford 2, Connecticut, U. S. A.

2322

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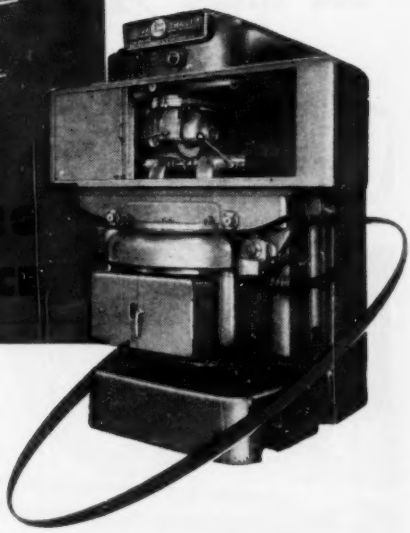
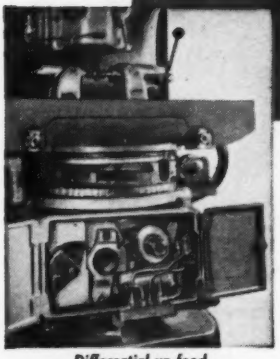
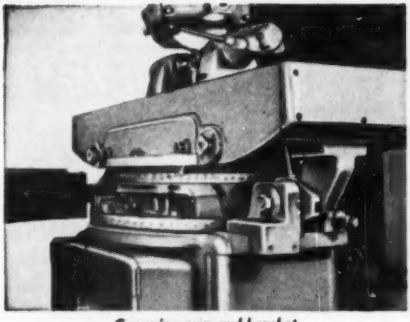
To GEAR SHAVING PRACTICE





Differential up-feed mechanism



Crowning cam and bracket

Two new features are now optionally available with the Red Ring Gear Shaving Machine Model GCU — Automatic Differential Up-feed and Conventional Crowning. So equipped, any of the recognized processes in the field of rotary gear shaving may be performed on this machine. It thus becomes economically applicable to both high production and to job shop operations and to gears of all characteristics within its size range.

Specifically the Model GCU with these additions can be used for:

(1) Diagonal shaving at fixed center distance on a two stroke cycle.
(2) Diagonal shaving on an automatic multi-stroke cycle with selected increments of up-feed and dwell.
(3) Conventional shaving on an automatic multi-stroke cycle with selected increments of up-feed and dwell.
(4) Precision gear crowning accomplished by rocking the table during any conventional shaving cycle.
(5) Taper shaving to specification.

Automatic cycling is precise and very fast. Production rates are high and cutter life has been increased to as much as 200%.

Write for Bulletin 553-7 which gives all the details of this important new development.

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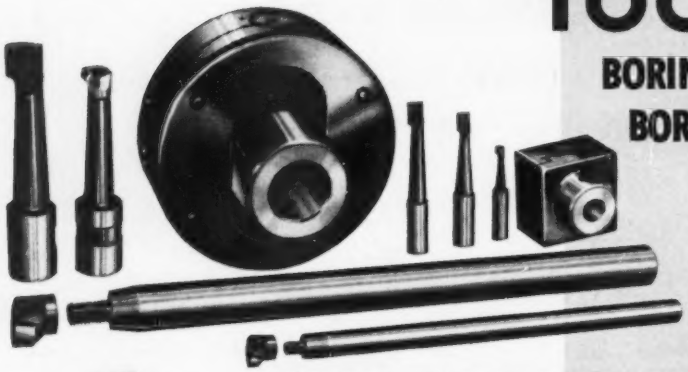

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BORING PROBLEMS? CLOSE TOLERANCE?

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THIS COMBINATION WILL PRODUCE RESULTS.

Boring heads from 1½ to 7 inch diameter. Boring tools, carbide or high speed steel, ⅜ to 1¾ inches diameter. Bore holes from ⅛ to 20 inch diameter.

Accuracy for the closest tolerance • Rigidity for the heavy cuts • Heat-treated parts for long wear

LARGE OFFSET SAVES TIME AND TOOL CHANGES

These tools will cut your boring costs.
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FOR CARBIDES— CAST ALLOYS— HI-SPEED STEELS

A complete line of grinders, for efficient and economical sharpening of single point tools. All are double-end models using cup type wheels; with large tool rest tables, easily adjusted.

54-40

WRITE FOR THIS BULLETIN

It shows and describes five models; also gives important data on tool grinding. Write today to Ex-Cell-O in Detroit for Tool Grinder Bulletin.

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DETROIT 32, MICHIGAN

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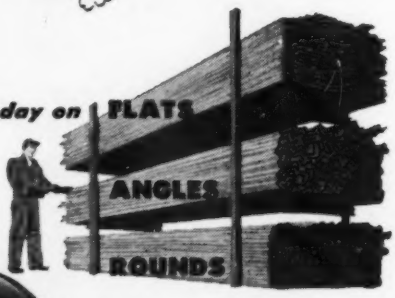
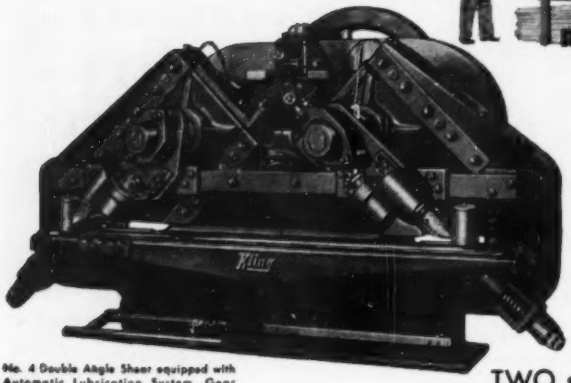
It's the BUSIEST machine in the shop!

...gives more cuts per day on





No. 4 Double Angle Shear equipped with Automatic Lubrication System, Gear Guards and Automatic Hold-downs.

Kling double angle shears

TWO shears in ONE machine!

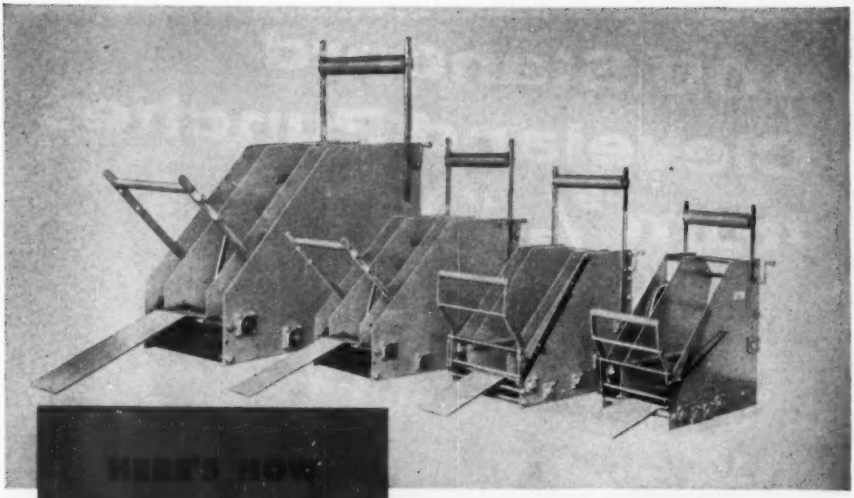
If you're using obsolete, slow-poke methods of shearing, the Kling Double Angle Shear can help you save time and money. This modern compact machine is designed for high speed, high production shearing on both long and short run jobs. Many metal fabricating plants and steel warehouses have found the Kling Shear to be the workhorse of the shop. For instance, one machine will shear round bars and bar angles on the left side while the right side can be used for structural angles and flat bars. The machine is built with the speed and power to handle the bulk of your shearing requirements. For shops with considerable mitre shearing work, Kling Double Angle Shears can be mounted on a turntable to facilitate handling. Automatic hold downs and one-shot lubrication can be furnished when desired. Sizes to handle angles up to 8" x 8" x 1½"

WANT TO CUT SHEARING COSTS?

Find out how this high-production machine, available in four sizes, can give you more cuts, cleaner cuts on your shearing operations. Write for more information and latest bulletin. Kling Bros. Engineering Works, 1320 North Kostner Avenue, Chicago 51, Illinois.

SEND FOR NEW BULLETIN 2345. 5808 MMRRR

Since 1892 **Kling** ***...an investment in speed!***



HERE'S HOW

benchmaster

Koil Kradle

IMPROVES ALL AUTOMATIC FEEDING!

BIGGER COIL CAPACITY—handles 200 to 400% more weight at one time!

FEWER SHUTDOWNS—Big coils run hours longer, eliminate production losses during reloading periods!

FASTER, EASIER LOADING—you simply roll the coil up the ramp into feeding position. No heavy lifting. Strenuous labor is eliminated!

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VARIABLE TIME DELAY allows operator to set unit to consistently maintain any desired length of slack loop.

KOIL KRADLE automatically supplies a slack loop from any type of coiled stock, wire or strip. Can be used with punch presses, slitters, shears, forming rolls, etc. Removes drag on feeding devices, improves locating accuracy on multiple and progressive die operations.

Write for new circular!

Benchmaster Manufacturing Co.
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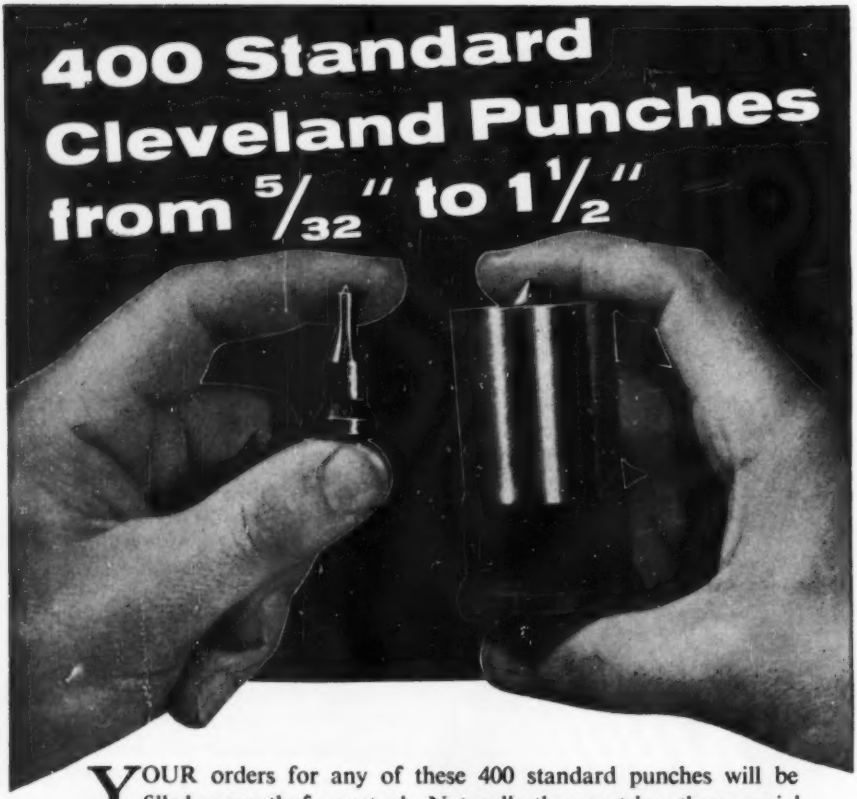
benchmaster

400 Standard Cleveland Punches from 5/32" to 1 1/2"



YOUR orders for any of these 400 standard punches will be filled promptly from stock. Naturally they cost less than special punches. What's more, when you order Cleveland punches you're sure of getting quality tools backed by years of specialized experience. We're constantly experimenting with various steels and processes so that we can give you the very best.

Are your punching machines equipped to use standard Cleveland punches? If not, it will pay you to investigate the many advantages of standardization. For detailed information send for our new Catalog No. 12 today!

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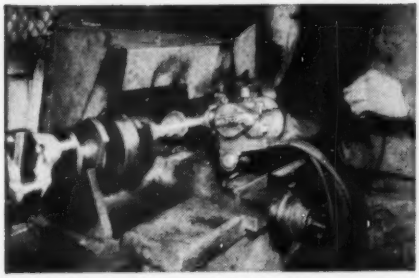

Automotive crankshaft being brought up to inspection standards with metallizing. This automotive manufacturer formerly used plating for this type of salvage, worked one per hour. With metallizing, the salvage operation requires only 5 to 10 minutes per shaft, including surface preparation.

Free Bulletin

Get the full story on metallizing in production salvage. Bulletin 57-C describes and illustrates the procedures, provides data on typical parts, with interesting photo-micrographs showing the unique bonding action of Sprabond Wire. Send for a copy.

METALLIZING ENGINEERING CO., INC.

38-14 30th St. Long Island City 1, N. Y.

In Great Britain: Metallizing Equipment Company, Ltd. Chobham near Woking, England

...and they do in any busy machine shop, there's no need to scrap a mis-machined or otherwise damaged machine part that represents an investment of many expensive man-hours.

Parts like these are brought up to inspection standards quickly, easily and inexpensively with metallizing.

And with the new molybdenum metallizing wire, Sprabond, the only surface preparation required is cleaning. The molybdenum forms a molecular bond with the surface being rebuilt. Little heat is generated, eliminating any danger of warpage.

What's more—users have found that the extreme hardness of the molybdenum coating, and its microscopic porosity which provides superior lubricating characteristics, improve its "wear-ability" over ordinary bearing surfaces as much as 25 times. **You haven't just salvaged a part—you've improved it.**

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Don F. Watson, Metallizing Eng., Co., Inc.
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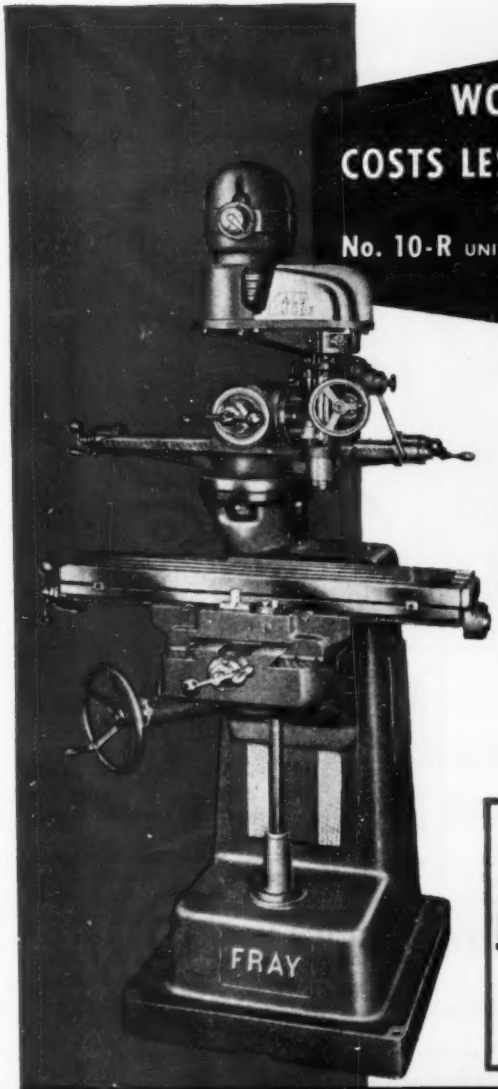
WORK MOVES FASTER
COSTS LESS with a Fray
No. 10-R UNIVERSAL RAM • TURRET TYPE • VERTICAL
MILLING MACHINE



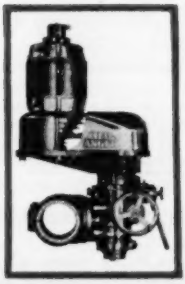
You get a wider work range than with any other machine this size. You can machine at *any* angle—vertical, horizontal or both. You can mill, drill or bore at *any* angle. Hence resetting isn't necessary. Just change the machine—changing is quick. (For vertical and regular horizontal milling, use the 10-RH.) Jobs are done faster and better . . . at less cost. • It's Universal • Rugged • Easy to Operate.

A high precision tool.

Write for details and specifications.

Bulletin 10.

FRAY "ALL-ANGLE" HEAD TYPE 4



For deep, heavy cuts. Permits working to extra close limits. Any angle up to compound 2-way. Request Bulletin 4.

All-Angl

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A complete Cam and Tool Service for Automatic Screw Machines

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high speed steel or carbide. Your drawings and specifications faithfully followed

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Carbide inserts, complete stocks on hand, immediate delivery.

ALCO KUTKOOL

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Diamond Wheel

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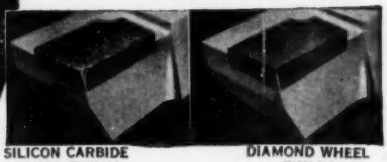

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Diamond wheels produce finest edges of any conventional grinding process — edges that are stronger, last longer, cut better and faster — and reduce costly set-ups to a minimum.

Now EVERY Shop can afford Diamond Wheels for Tool Grinding

Yes, a real diamond wheel (6" dia., ¾" face) for a fraction of what you are now paying. This revolutionary new single layer diamond wheel has convinced the toughest skeptics in actual shop tests. In one large shop—this new Super-Cut Diamond Wheel gave an excellent micro-finish to 4900 single point carbide tools **—at a diamond wheel cost of less than 1¢ per tool.** In comparative tests, this Super-Cut Diamond Wheel produced finish ground carbide tools for 1/3 less than an abrasive belt machine—and gave a better cutting edge. Made by exclusive new electroplating process that bonds diamonds in a hard, non-loading nickel —and assures that every diamond is working at all times.

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Please send me literature on your new $45 Super-Cut Diamond Wheel and 10-day Trial Offer.

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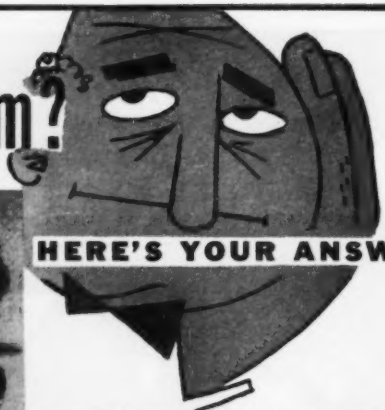
milling problem?



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The PORTLAND milling head was especially designed and engineered to solve heavy duty milling problems . . . milling of armor plate, special alloys, etc. These heads are easily adapted to outmoded planers . . . converting them into powerful, modern, efficient planer-type milling machines.

SPECIFICATIONS

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- Horsepower ratings available from 10 to 100

Write for complete information today
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ON angular set-ups the Magna-Sine saves hours of set-up time, provides positive accuracy, holds work securely without distortion.

The Magna-Sine is a quality permanent-magnet chuck mounted on precision hardened and lapped hinged plates. A Table of Constants provided, quickly shows the standard gauge blocks to insert between the plates for any angle—single or compound. Set-ups to gauge block accuracy take minutes, not hours! When closed, the Magna-Sine is used as a conventional magnetic chuck. Thousands are in daily use.

Write for your free copy of the Magna-Sine Catalog which shows all styles and sizes . . . price list is included.

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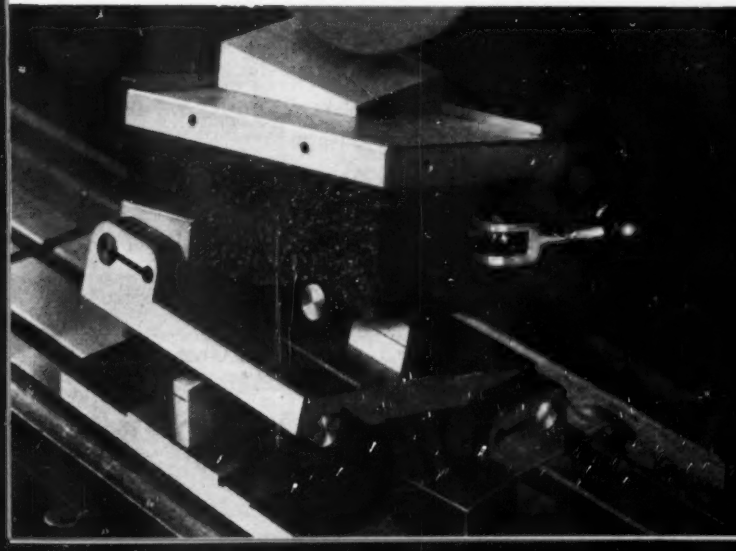

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GRINDING
INSPECTION
DRILLING
BORING

AT ANY ANGLE

NEW "InteRapid"

★ Complete Unit

★ Accurate

★ Quick Setting

★ Easily Read

★ Precision Made

★ Guaranteed

New Internal Comparator Gage has gaging capacity from ⅜" diameter to 6" diameter. Meter-type scale, graduated in .0005", shows at a glance whether holes are oversize or undersize and by exactly how much.

Gage is designed for use on Jig Bores, Boring Machines, Internal Grinders, Lathes and for all Inspection Personnel.

For complete details . . . write for Comparator Specification sheet.

PORTAGE Double-Quick TOOL CO.

1037 Sweitzer Avenue • Akron 11, Ohio

Featured IN THIS ISSUE

Trends and New Developments in Production Tapping 121
Reclaiming Overmachined Parts With Electroless Plating 132
Reduce Costs With Dial Feeds 203

New Trends and Developments in Production Tapping, by Harry Conn. While bigger and better machines are being built, what of the actual cutting tool? Harry Conn, an expert on special machining and tooling, discusses the advances made in tapping. Long a fighter against tap breakage, Mr. Conn discusses a development which radically reduces tap breakage. Page 121

Reclaiming Overmachined Parts With Electroless Plating, by Frank Charity. Electroless plating eliminates many of the shortcomings of other reclamation processes. For many years merely a laboratory method, it is now being applied in general industry. Deposits on parts can be maintained within tolerances of plus-minus .00001". Page 132

Two Operations at Torrence . . . Deep Hole Drilling and Safe Milling, by Clifford Clayton. Two rather interesting installations at Douglas Aircraft's facility in Torrence, Cal., are worthy of note. One is a milling operation with a safety feature, the other is a deep hole drilling job. Page 140

Work Simplification . . . Some Simple Assembly Devices, by C. T. Bower. In our complex industrial structure the search for speed leads to more complicated methods in machining as well as in assembly work. We sometimes forget that many assembly operations are still simple. A few simple ideas might prove helpful for many smaller shops. Page 146

Titanium Carbide Rod Mill Guides. Rod mill yields are being upped, production downtime decreased, and scrap reduced 80%; in addition, the finished rod's cross sectional accuracy and finish are improved. Page 150

Plant Communications . . . Employee Publications and Other Devices, by Edmund Mottershead. Another Foremanship Forum, this one is a continuation of last month's plant communications series. Page 154

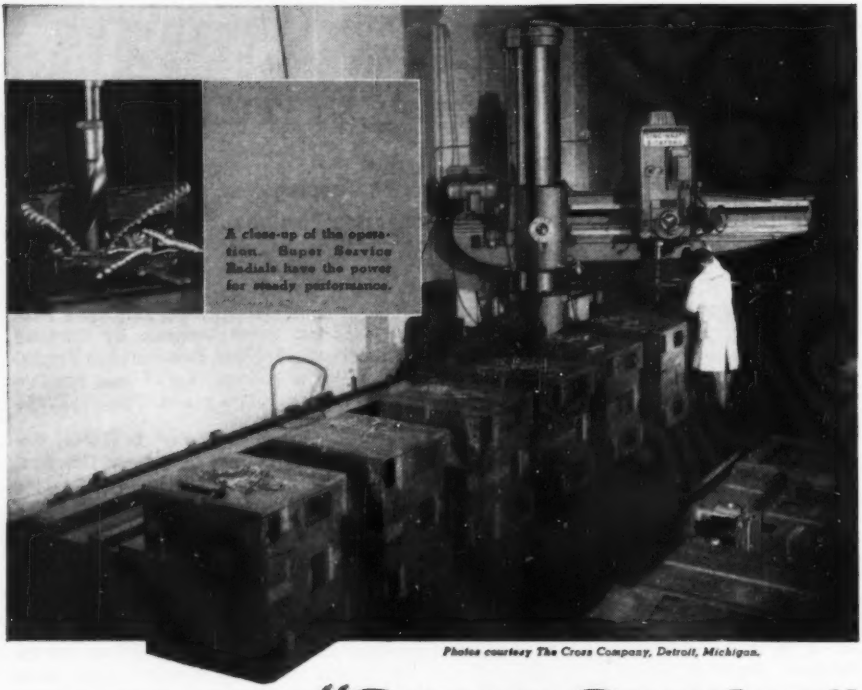
Improved Operating Valve is Safer, Reduces Press Downtime, Equipment Damage, by M. Bryan Baker. Another in the series of New Design and Operations Feature. Page 162

Time and Cost Saving Ideas, by Walter Strike. Novel ideas, original tooling, smart shop practice are still needed by America's metalworking plants, regardless of the number of robots on the line. Mr. Strike has used a number of simple tooling ideas for a number of years. A few of those ideas are contained in this article. Page 181

BLUE BOOKS's "Know-How" REFERENCE SHEETS. This month's Reference Sheets tie in with the special report on Presses. They deal with weights of sheet steel blanks, etc. Page 197

Reduce Costs With Dial Feeds, by William W. Schug. This is the major article in the special report on presses. The major purpose of dial feeds is to reduce costs and increase production. Dial feeds are of various kinds and depending on the type of operation they are of definite help in upping production. Page 203

Special Report on Presses. This is the 39th report in BLUE BOOK's series on American built machine tools. Included in this month's series is an article on dial feeds, specifications of late model presses and descriptions of various presses made in this country. Page 203



Photos courtesy The Cross Company, Detroit, Michigan.

a traveling "Super Service" does this LARGE AREA JOB . . .

Here at The Cross Company ten Cincinnati Bickford Super Service Radial Drills are at work . . . On this job, the traveling Radial with sliding base, saves time and gives high production with necessary accuracy. In each of the 7 bases handled here there are 20 holes drilled and tapped and one 3" diameter bored and chamfered. The Cross Company say these drilling machines "bring easy handling, dependability and durability."

Write for Catalog R-29.

80 YEARS OF SERVICE

CINCINNATI BICKFORD

RADIAL AND UPRIGHT DRILLING MACHINES

THE CINCINNATI BICKFORD TOOL CO.

Cincinnati 9, Ohio, U.S.A.

AS THE *Editor* SEES IT

Patent Pending

WHEN a small boy goes to a little pond what's the first thing he does? You're right, he grabs a stick and begins to swish and swush this weapon through the water, muddying the pond. Left alone, and given enough little friends, the entire pond would change from deep blue to brown mud in a matter of minutes.

I wonder if many of our nation's lawmakers aren't little boys with big sticks? The latest little pond they're vexing is the United States Patent Office. While this office is a little pond only in relation to other offices and bureaus, it is no mud hole in its scope and importance.

A move is afoot in Congress to cut appropriations of the Patent Office from $12,080,000 to $11,000,000, or nearly 10%. Testifying in January, Patents Commissioner Robert C. Watson said that 165 employees would be fired, 95 of them examiners, if this cut were adopted. At the present time there are only 650 examiners, far below the number needed for full efficiency.

The Patent Office now has a backlog of approximately 200,000 applications; each year 70,000 new applications are received. Even under present conditions it takes an inventor three years before he receives his patent. Reduce the number of examiners and this time interval between application and receipt of patent will stretch even longer.

It does appear that cutting appropriations of the Patent Office is mighty poor economy. Holding up patents for an additional year or two, thus making it four or five years between application and receipt, could conceivably cost the government millions of dollars in lost taxes through profits from a new product.

Products are invented for hope of profit as well as through necessity. Delay the profit and you delay invention. Remove patent protection entirely and all research and inventing stops. No man will spend a nickel and a minute of time on a product or a method which the guy across the street can swipe without getting out of his swivel chair.

Rather than cut appropriations they should be increased. Instead of lawmakers grabbing sticks too heavy for them and rushing to the water's edge, they might do well to do a little research on the subject of research. They might even try to invent something, thus giving them tastes of the plights of poor inventors. You know, they might even invent a method of following through on recommendations to economize in the government. The $1,020,000 they would clip from the Patent Office could easily be made up by plugging some of the waste holes in the billion dollar appropriations.

William F. Schleicher

"Maintenance costs small, operators like LeBlonds..."

machine tool builder Greaves

Lineup of LeBlond Lathes at Greaves: 17" Rapid Production (foreground), seven 17" Regals and a 15" Regal. Turn precision parts for milling machines on 24-hour schedule. Dependable, versatile, accurate, cost little to maintain.

tells why he uses LeBlond lathes

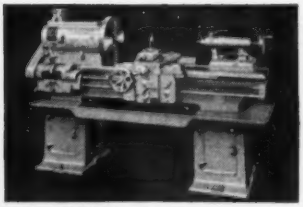
No one knows machine tools better than people who build them. And Greaves Machine Tool Company, Cincinnati, builder of milling machines, owns nine LeBlond Lathes! Eight Regals and a Rapid Production.

Since 1941, some of these lathes have worked almost 24 hours a day on full-schedule production for precision milling machine parts, woodworking machine parts and sub-contract work.

Bill Greaves himself says, "*Maintenance costs are extremely small, operators like working on their LeBlonds—because they're easy to operate, convenient, have a great deal of power for their size. Give long sustained accuracy, especially in boring and turning tapers*".

A machine tool man like Bill Greaves knows what he's looking for in a lathe. His opinion counts. When he says our lathes have what it takes, we feel it's a tribute of the highest order!

Check the variety of jobs these versatile lathes handle at Greaves. Sound like some of the parts production work in *your* shop? LeBlond Lathes can speed up jobs like these, keep your maintenance costs down to a bare minimum.

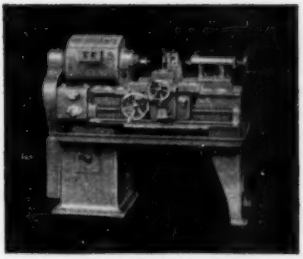


LeBlond REGAL Lathes

Light-duty lathes with heavy-duty features—ideal for production, job shop work and training. Geared headstock, quick change feed box, separate leadscrew and feed rod, taper key drive spindle nose, one-piece apron. Swings—13", 15", 17", 19", 21", 24", and 13" bench model. 17", 19", 21", 24" Gap and 17"/28" Sliding Bed Gap. Write for Bulletin R-J, stating sizes you are interested in.

Typical Jobs:

Bushings • Shafts • Armatures • Expansion arbors for mounting gears • Bevel gear blanks • Spindle for universal head • Sleeve gear blanks for Milling Machines • Tumbler for reverse drive • Formica gear blanks (laminated canvas-based gear material)



LeBlond RAPID PRODUCTION Lathes

Designed especially for low-cost high-production turning. Not a stripped-down engine lathe. Choice of headstocks gives you speeds within the range you choose. Swings—13", 17" and 20". Write for Bulletin RP J, stating sizes you are interested in.

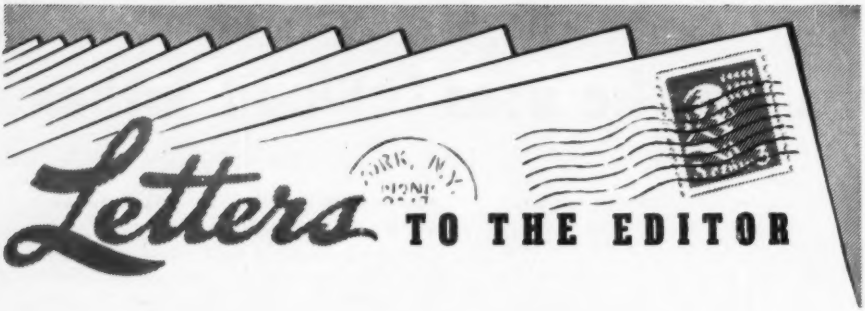
THE R. K. LEBLOND MACHINE TOOL CO., CINCINNATI 8, OHIO

Your nearby LeBlond Distributor will give you all the facts. Call him soon, or write.

turned faster by

LEBLOND *of Cincinnati*

WORLD'S LARGEST BUILDER OF A COMPLETE LINE OF LATHES—FOR OVER 64 YEARS.



Honeycomb Processing Method

The Shell Petroleum Company, Limited, in England have received a copy of a reprint of the article entitled "New Honeycomb Processing Method," which appeared in the February, 1954, issue of the MACHINE and TOOL BLUE BOOK, and would like to reproduce this article to assist them with their sales development work in Great Britain.

Accordingly, it would be appreciated if you would give your approval for the reproduction of this article for their sales promotion work. Proper credit would, of course, be given to the MACHINE and TOOL BLUE BOOK.

A. V. Snider, Mgr. Export Dept.
Shell Chemical Corp.

We're delighted to have you reproduce the article.

Taper Swaging

We would be very grateful if you can tell us how, or put us in touch with a manufacturer of a machine to make tapers.

We do a great deal of taper swaging on tubing of various diameters but are limited to the length of any taper to the length of the dies which normally is six to eight inches. Anything beyond that dimension is done with multiple sets of dies, the result not being too satisfactory from a price and production point.

Carl F. Jungk, President
Inglewood Industries, Inc.

The Configured Tube Products Co., Bellwood, Illinois, will be able to help reader Jungk.

Information Please

I am a reader of the MACHINE and TOOL BLUE BOOK and like it very much. Can you furnish any information on automatic Metal Spinning? Would like to know where I can get information about tooling and equipment used in this process.

Floyd S. Crider, Owner
Crider Machine & Tool Shop

A list of names has been sent to reader Crider.

In the April issue of the BLUE BOOK in your article on spade drills you mention coolant pressure of 300 p.s.i. being used.

We have been trying to locate a coolant pump that would give this pressure that the fine chips in the coolant would not damage.

Any information or suggestions you could offer would be very welcome.

D. H. Parker, Eng. Dept.
Cone Automatic Mach. Co., Inc.

The Gairing Tool Co., Detroit, Mich., will furnish such a pump.

We are desirous of obtaining a list of organizations in the United States who do machine designing, or possibly mechanical engineering firms that do machine design work.

Have you any such list of names or can you suggest where we might obtain one.

Wm. S. MacWilliams, Sr. Vice Pres.
Kidde Precision Tool Corp.

The only list we have available is that which was published in the 1954 BLUE BOOK Directory. This has been sent.

Perhaps you can give us some information as to what may have happened to the American Tool & Salvage Corp., at 100 So. Jefferson St., Chicago, Ill.

We used to have our milling cutters ground by them; however last week we mailed some to them and they were returned, marked by postal authorities as not there.

V. G. Larson
Walter K. Mick Co.

The American Tool Salvage Corp. name has been changed to American Tool Service Corp. and their new address is 415 N. Damen Street, Chicago.

Jet Issues Available

Recently had a chance to see a copy of the Jet Power Issue of MACHINE and TOOL BLUE BOOK, and was very much impressed by its content. Being in the business of manufacturing Jet Engine Components, we found much that was of interest to us.

We would appreciate receiving a copy of this valued book, The January Jet Power Issue, which we may keep for reference purposes.

Sidney J. Block, Supv.,
Metallurgical Lab.
Brown-Lipe-Chapin Div.,
General Motors Corp.

A copy of the Jet Power issue has been sent.

Work Simplification

In connection with some work I am doing in Work Simplification, I am trying to get a copy of Mr. Harold Nissley's article on Rules of Work Simplification for Supervisors which I understand was published in MACHINE and TOOL BLUE BOOK. Would it be possible to obtain a reprint of this article, or a copy of the BLUE BOOK in which it appeared?

Edwin T. Hellebrandt, Chm.,
Dept. of Management
College of Commerce
Ohio University

Tear sheets were sent to reader Hellebrandt.

Special Reports

I should like to know if it is possible for my name to be added to those who now receive the BLUE BOOK. I have had several copies and find the information very helpful in our Engineering Department.

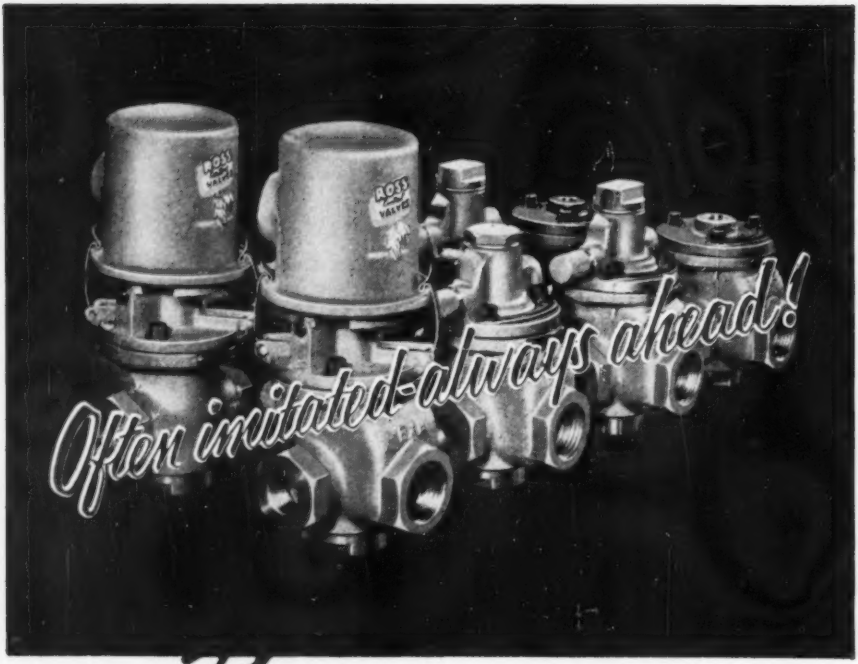
I would be grateful if you could let me have a copy of each of the reports, Nos. 1 to 35 inclusive.

If you have any "Who, if not you? When, if not now?" cards on hand, may I have two or three cards.

C. F. Cole, Design & Process Sup.
Curtiss-Wright Corp.
Metals Processing Division

Reader Cole's name has been passed on to the circulation department. Reprints of the special reports are completely exhausted. Almost 35,000 reprints were made and we're sorry to say that they have been snapped up; however, the special reports are available in book form, Volumes 1 and 2 of American Built Machine Tools. Volume 1, published in 1952, is $3.00 and Volume 2, published in April of this year, is $4.50.

We have a few Who-When signs left and they have been sent. Incidentally, one of our cartoonists latched onto the idea and sent us his version of a Who-When card. Reprints of the cartoon, unfortunately, are not available; we do have a few dull and uninteresting Who-When cards in our desk and will send them out to all who want them.



Ross In-line Valves

The reputation and performance of Ross In-line Series Valves are so outstanding that imitations are constantly being attempted. Through constant improvements, the Ross In-line Series remains the leader and the envy of the trade. Here's why—

- ***Dependable***—10 to 20 million maintenance-free cycles, and many more tens of millions of life-cycles, are not uncommon.
- ***Speedy***—split second operation; oversized exhaust.
- ***Low current consumption for solenoid models***—inrush of 1.2 amps @ 110/60.
- ***Positive seal***—poppet construction; Hycar seals.
- ***Easy maintenance***—only a few moving parts; can be disassembled without breaking line connections — solenoids readily accessible.
- ***Many modifications***—vacuum, air, and liquid service; various pressures; available for AC or DC solenoids or air actuation with or without sequence timing; interchangeable heads.

Write for full information on the Ross In-line Series

Amtrol

Ross OPERATING VALVE COMPANY

108 E. GOLDEN GATE AVENUE • DETROIT 3, MICHIGAN

LAST MINUTE WASHINGTON NEWS

★★★

by Arnold Kruckman
Washington Correspondent

Even off the record it would seem proper that the industrialists who make machine tools and allied products, as well as all other industrialists, should know that most official Washington, under cover, believes that it is more than likely, even probable, that we shall get into the Indo-Chinese War. Our information here does now rest upon the varied stories that come out of Geneva; nor is it scuttlebut in the local sense that is so prevalent in Washington. But it is unofficial, unconfirmed information that comes through official sources. In other words, officials at both ends of Pennsylvania Avenue seriously believe what is reported in this Letter.

Probably the most arresting word is the direct report that the Republicans on the Hill, especially the Republican Senators, are very gloomy, and often depressed, because White House favorites have circulated a draft copy of a Resolution asking Congress for Presidential stand-by controls and a free hand to make war in Southern Asia. You and I are disturbed by this action because it again throws the national economy into a curious muddle; mothers and fathers are disturbed because it means their sons—and sometimes their daughters—are sent across the Pacific to fight a war with which they have no sympathy. But your Republican Senators are particularly disturbed because they fear that anything like the approach to an Indo-Chinese War will mean Republican defeat at the polls. So you see, the reason for the various unhappinesses flow from different sources.

It is of immediate interest to your industry, as well as to other industries, that the controls to be exercised and applied already are in perfect blueprint form. We are told here that any emergency controls which might be reimposed will freeze wages, prices, rents, etc., at the discretion of the President; and that the controls will not be selective but will blanket the whole economic field and the related social needs. Of course very few people know what the White House really has in mind. The details have been discussed only with the inside group, with those whose immunity from the habit of gossip is almost 100% certain. The fact that controls are so close inevitably are revealed by such actions as the paper which was circulated in the Senate, and by absolutely unavoidable in-

BAKER

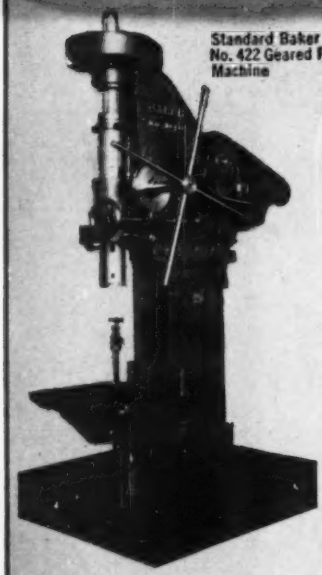
Standard HEAVY-DUTY DRILLS

2 to 4 WEEKS DELIVERY . . .

ON THESE MACHINES—Subject to prior sale

Standard Baker No. 150 Geared Feed Machine

Standard Baker No. 217 Geared Feed Machine



Standard Baker No. 422 Geared Feed Machine

Standard Baker No. 321 Geared Feed Machine

MAJOR SPECIFICATIONS—Single Purpose Types

	150	150 Q.C.†	217	321	422
1. Capacity—Max. Dia. Drill in S.A.E. 1035 Steel	1½	1½"	2	3	4½
2. Max. H. P. Motor used	7½	7½"	10	15	20
3. Distance center of Spindle to Frame (Gap)*	11"	11"	12¼"	12¼"	12¼"
4. Maximum Spindle Travel	11"	11"	12"	16"	16"
5. Spindle—Outside Dia. splined driving end	1¾"	1¾"	2"	2-13/16"	3¼"
6. Dia. of Spindle Sleeve	2¾"	2.750"	3¼"	4¼"	5¼"
7. Dia. of Spindle Nose	2.975	2.975"	.3225	4.225"	5.225
8. Morse Taper in Spindle as standard	No. 4	No. 4	No. 5	No. 5	No. 6
9. Standard Speed Range in R.P.M.	151-632	48-1120	76-614	27-220	20-165

* Can be increased 3" by use of offset Spacer Block. † Quick Change, 12 Speeds

Baker single purpose type drills are heavy duty . . . provide a wide range of speeds and feeds for Single and Multiple Spindle Drilling . . . Reaming . . . Boring . . . Facing . . . Chamfering . . . Undercutting and Tapping Operations. Write for full details.

SINCE 1867

BAKER BROTHERS, INC. Toledo, Ohio

DRILLING . . . TAPPING . . . KEYSEATING and CONTOUR GRINDING MACHINES

quiries which were made in the various agencies and departments of the Federal Government.

No one knows what the program is for any possible draft. It runs according to normal pattern the youngsters with the least responsibility will be the first called. And it is generally assumed that the first group of fighting men who will be sent into Indo-China will be the professional soldiers of the Marine Corps. It is no secret that we have few fighters of finer training and tougher ability than the Marines.

One curious aspect of this business of the war in Indo-China is that the French repeatedly are said to have refused to draft their young men to carry on their battle in those jungles. At the same time the French demand that such commercial products as France can supply shall be given preference when needed for the war. The French do not seem reluctant to send their young men because of any humanitarian restraint; they are afraid that the absence of the young men will be dangerous for the internal affairs of France, and that their draft may lead to internal conditions which they would find difficult to meet. Someone who knows France well said the other day here that it is wise to remember that there are never less than 100—and usually more—deputies in the French Parliament who are Communists. In order to understand what confronts us in Indo-China it is necessary to understand this situation as well as others.

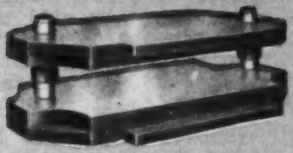
What Americans usually do not seem to understand is that the Soviet Union, to a large extent, is no more eager to precipitate a general war in Asia than we are. It doesn't filter out in our news, but it is a fact that the Russians are very uncomfortable about the Chinese. The Chinese are actively, as Communists, driving for the consummation of the Asiatic dream of Asia for the Asiatics. Your Asiatic friend in this country may make light of the idea; but there is scarcely an Asiatic of any one of the Asiatic groups who does not hope that the Asiatics will drive all the Westerners out as quickly as possible. And most of them, probably all of them, look to the leadership of the Chinese to accomplish this end in a military sense. They seem to be perfectly willing that the military objectives may be achieved, and to take a chance on what may happen, after the accomplishment, in Asia itself. There are things going on in outer Mongolia, and in other parts of China, about which we know little, which may give the Asiatics far greater military power than we assume. Our intelligence about China and Chinese, as well as other parts of Asia, is very crude and misleading. We know it and it troubles us. And by the same token the Russians know it and it troubles them because Russia is confronted by an Asiatic problem that it finds very difficult to meet. At the present time the chief efforts of the Russians in Asia, and elsewhere, wherever they team up with the Chinese, is to strive for their good will and keep down their ambitions. They don't want them to explode prematurely, because they don't know what might come out of such explosion. Russia—not the Communists, but the Soviet Russia as an Empire—in many ways stands in as much danger as we do.

It is generally assumed here that when the war comes in Indo-China it will again be one of those token conflicts in

Specify DETROIT for any type of die set

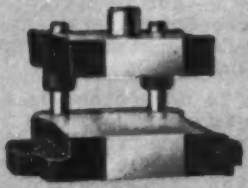
Special **ALL-STEEL Die Sets**

. . . of any type or size accurately made to the most exacting specifications.



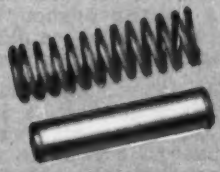
Special **SEMI-STEEL Die Sets**

. . . using premium castings for high tensile strength and good machining qualities.



Stock **DIE SETS**

. . . Precision or Commercial . . . available for prompt shipment in a wide variety of sizes.



Precision-Built **ACCESSORIES**

. . . an extensive range of high-quality die-makers' supplies in stock for immediate delivery.

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DIE SET CORPORATION

Call "Detroit"

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DETROIT	TR 2-5150	FLINT, MICH.	8-7361	NEWARK	MA 2-4318
BALTIMORE	PL 2-4641	GRAND RAPIDS, MICH.	3-1895	NEW ORLEANS	RA 6528
BIRMINGHAM, ALA.	3-1341	GREENSBORO, N.C.	4-7655	ORLANDO, FLA.	2-3747
BUFFALO	CI 0163	INDIANAPOLIS	HU 5604	PHILADELPHIA	VI 4-4084
CHICAGO	PU 5-0500	KANSAS CITY, MO.	VI 3558	PITTSBURGH	LO 1-4011
CINCINNATI	HU 7775	LOS ANGELES	AD 7251	ROCK ISLAND, ILL.	8-2814
CLEVELAND	TO 1-0860	MILWAUKEE	GL 3-7170	ST. LOUIS	FR 6811
DALLAS	TE 5029	MINNEAPOLIS	OR 5-7980	SEATTLE	EL 6644
DAYTON	HE 3042	MONTREAL, CAN.	GL 6126	TOLEDO	MA 4510
DECATUR, ILL.	8-3474	NASHVILLE	6-2597	TORONTO, CAN.	KE 2972
DENVER	SH 2451			WASHINGTON, D.C.	AD 4-5700

which we will supply the men and the means and the UN will supply the tokens. No one depends very much upon the British, because Britain has all it can do to save Malaya. It may even lose Malaya as things are going.

Incidentally, the draft calls, already planned, will be considerably bigger this summer. Arms orders are expected also to soar. Armament will be a bigger business.

It is not fair to blame any war that may explode in Indo-China on Mr. Eisenhower. From all word we get he doesn't want war. But he is being pushed into it by men like Admiral Arthur Radford, Chairman, U. S. Joint Chiefs of Staff, and the influential members of the Palace Guard who, in turn, represent the substance of the Eastern Seacoast which was responsible for that which made possible the election of Mr. Eisenhower.

* * *

The job of looking after the machine tool work on the civil side of the Government—when it comes—will fall to the Metal Working and Equipment Division of the Business and Defense Services Administration in the Department of Commerce. In all likelihood the heads of the Division already have a very clear idea of the blueprint of what is expected that they shall do. The Division is the main building, Room 4015. The telephone is Sterling 3-9200, extension 3525.

Ralph E. Cross, of Cross Company of Detroit, is the Director of the Division. His Assistant is H. E. F. Hawkins. In the days when the Division was functioning fully for the service of the industry it had 150 members on its staff. This was not during the war but in those days immediately after the war when things had to be pulled together. Today the Division has twelve employees, upon whom is loaded the work of the 150. Naturally, when the blueprint is again put into effect the Division will be increased to full capacity. The number who will be employed is not known or even intimated. It will be interesting to keep an eye on the Metal Working and Equipment Division, and through whatever happens in its expansion, to get an idea of what is immediately ahead.

* * *

How to protect American industry from atomic attack will be the burden of a conference on industrial defense in the Atomic Age in mid-June in the National Chamber of Commerce.

The object of the conference is to find out how critical is the industrial defense problem; and what steps the Federal Government has taken or planned for industrial defense; and how industry can meet the problem. Defense Mobilization Director Arthur Flemming, Civil Defense Administrator Val Peterson, Administrator Charles F. Honeywell of the BDSA, Lt. General Willard S. Hall, Assistant Director for Non-Military Defense, and John Redmond, Assistant Production Manager of the Koppers Company, Pittsburgh, will lead the discussions of the conference. The Koppers Company is particularly outstanding in the manner in which it developed an industrial defense program.

* * *

The Foreign Operations Administration has announced that it has supplied funds to the Chinese Government at Formosa to purchase a considerable number of machine tools. These include contour shaping machines with various modifications or attach-

HOW THE SLAYSMAN COMPANY REDUCED THREADING TIME BY 97%

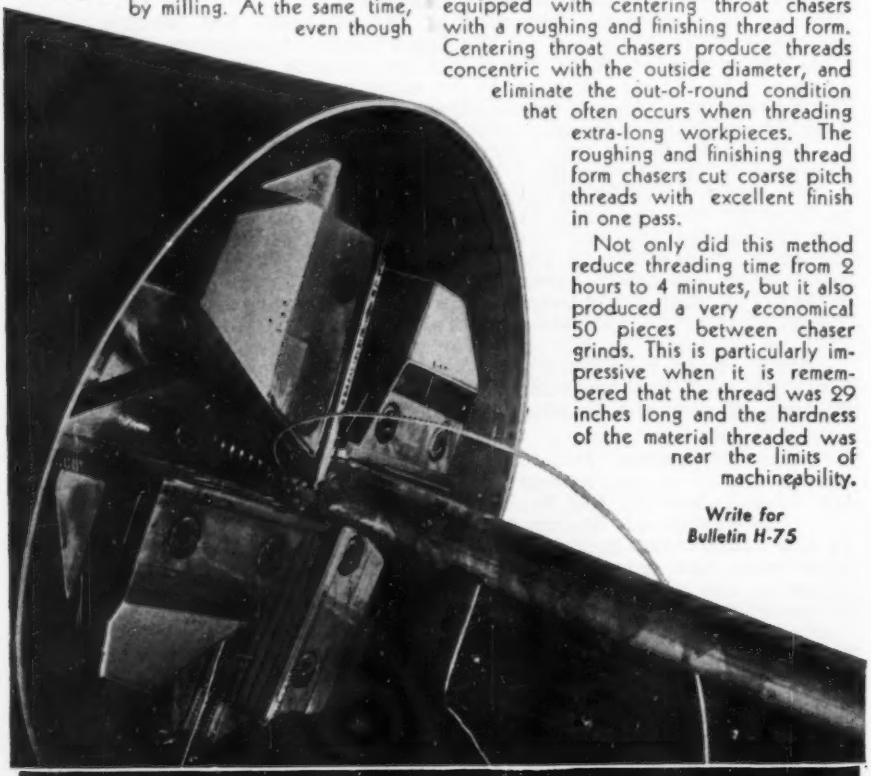
The Slaysman Company, a large machine shop and parts sub-contractor in Baltimore, reduced threading time on one contract operation from 2 hours to 4 minutes by the installation of a LANDMACO Threading Machine.

This contract required the cutting of a 1" diameter 5 pitch Acme thread 29" long on C1141 steel to a Class 3 fit. Original production plans were to generate the thread by milling. At the same time, even though the specifications and the hardness of the material seemed to preclude other methods, we were asked if we could suggest a more efficient threading process.

Based on our recommendation after studying the thread specifications, a 1½" LANDMACO Single Head Leadscrew Machine with an extra-long carriage was installed. The LANCO threading head was equipped with centering throat chasers with a roughing and finishing thread form. Centering throat chasers produce threads concentric with the outside diameter, and eliminate the out-of-round condition that often occurs when threading extra-long workpieces. The roughing and finishing thread form chasers cut coarse pitch threads with excellent finish in one pass.

Not only did this method reduce threading time from 2 hours to 4 minutes, but it also produced a very economical 50 pieces between chaser grinds. This is particularly impressive when it is remembered that the thread was 29 inches long and the hardness of the material threaded was near the limits of machineability.

Write for Bulletin H-75



LANDIS *Machine* CO. WAYNESBORO PENNA., U.S.A.

321

ments. The purchasing is done by Dr. S. W. Kung, Director, Division for the Central Trust of China, Chinese Government Procurement and Services Mission, Room 1508, 102 Maiden Lane, New York 5, N.Y. The FOA also has supplied a substantial amount of money to Spain for the purchase of machine tools. The name and address of the concern in Spain, which is authorized to make the purchases, may be obtained from the Office of Small Business, Foreign Operations Administration, Washington 25, D.C. Another procurement of machine tools with FOA's funds is announced in its Bulletin No. 154. The machine tools are to be purchased in the United States, Japan and Canada. They are to be procured through the Emergency Procurement Service of the General Services Administration, Washington 25, D.C.

FOA, in late May, brought to the United States two teams of French aircraft machinists to study our methods in mass production, particularly electrical and mechanical equipment. Machine tools were especially among the industrial products the two seven-men teams were to study. Among those they visited was the Sundstrand Machine Tool Company, Rockford, Ill. They travelled to Detroit, South Bend, Hollywood, Washington, D.C., New York and Grand Rapids.

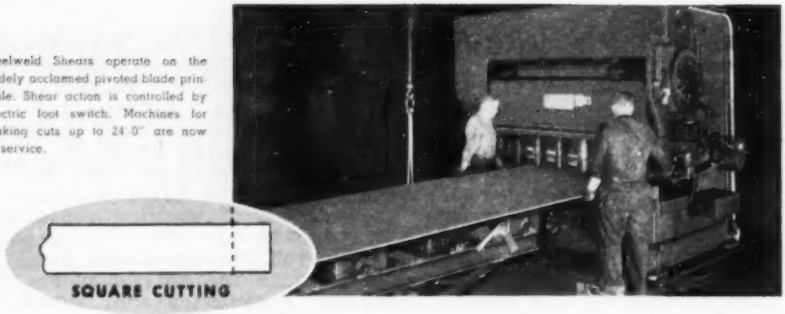
* * *

The Business and Defense Services Administration of the Department of Commerce announces that it reveals important technological advances in metals and metallurgy, and in instruments and instrumentation, in its May Bibliography of Technical Reports. It issues these Bibliographies, to those who may want them, for a small sum. . . . A Pittsburgh concern consented to a judgment in the Federal Court which terminated anti-trust practices. These had to do with metal processing and cast metal rolls. Under the agreement the practice may not be renewed and no territories may be set up for marketing, nor may orders be referred, nor sublet, nor subcontracted; price fixing and the exchange of price information is forbidden; and continuing agency or distributor relations with foreign manufacturers is eliminated. The Pittsburgh firm also may now prevent the importation of articles manufactured on the basis of its own technical information.

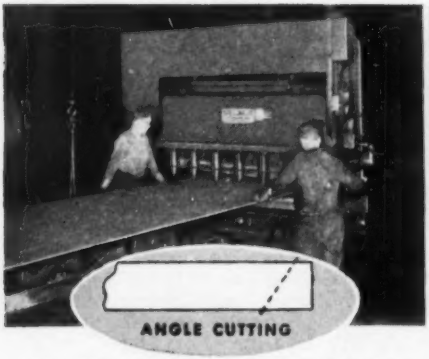
* * *

More copper is coming from Chile. The Kennecott Sales Corporation, acting for the Central Bank of Chile, is bringing 36,000 tons of Chilean copper to be added to the national stockpile. The General Services Administration, acting as procurement agent for the Government, pays 30¢ per pound, less allowances for fire-refined ingot copper. This concludes the negotiations for the purchase of 100,000 tons of copper. The Government also has bought 64,000 tons from the Anaconda Sales Company. . . . The GSA also made the interesting announcement that the U. S. Nickel Plant at Nicaro, Cuba, has returned to the U. S. Treasury $1.100 million, as well as produced nickel for our use and for other parts of the free world. This plant is to be expanded by 75% of its present capacity immediately. The sum returned was advanced early in World War II for use in purchasing the mines, and was one of the first in a series of investments which have now totaled to about $50 million. The plant itself is one of the world's largest nickel producers.

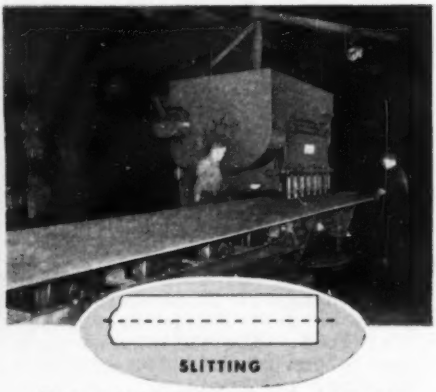
Steelweld Shears operate on the widely acclaimed pivoted blade principle. Shear action is controlled by electric foot switch. Machines for making cuts up to 24'-0" are now in service.



Here's a **VERSATILE SHEAR** that *Speeds Production*



Because of the deep throat in end housings, larger size sheets or plate can be cut at various angles than possible with most shears. This is also a great advantage when notching and slitting.



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How's BUSINESS ?

Report of First-Quarter 1954

WASHINGTON . . . Upon release of the first quarter tabulations, a $6 billion decrease in market value of the Nation's output was noted, as compared with the fourth quarter of last year. The annual rate of gross national product was, nevertheless, almost $10 billion higher than the 1952 total, and, at $358 billion, exceeded all but the fourth quarter of that year.

Reduction of business inventories continued during the first quarter of the year. Production stayed below purchases for final use. A moderate increase in liquidation was noted: from a $3 billion annual rate in the fourth quarter to about a $5 billion rate in the first.

At an annual rate, final purchases were down $4 billion. The largest decrease was shown in Federal national security outlays, which totaled $47 billion in the first quarter, as against $50 billion in the fourth quarter of 1953.

Total civilian final purchases declined only $1 billion from the $316½ billion fourth-quarter high, according to the U.S. Dept. of Commerce, exceeding by $7 billion the annual rate in the first quarter of 1953.

Personal income from all sources, at seasonally adjusted annual rates, amounted to $283 billion in the first quarter of 1954. This was $3 billion below the fourth quarter, but above the first quarter of 1953.

The first quarter of 1954 was characterized by a continuing increase in service expenditures and reduction in commodity purchases. From 33½ per cent of the total in the first quarter of 1953, outlays for services rose to 35½ per cent in the corresponding months of 1954. One billion dollars more was spent for consumer services in the first quarter than was spent during the fourth quarter of last year.

Housing accounted for the largest part of the increase, since the number of new homes is continuing to increase by over one million units per year. This expansion is naturally accompanied by a similar growth in such home services as electricity, gas, water, telephone, etc.

Purchases of consumer durables showed an annual rate of $28 billion, nearly $1 billion less than the fourth-quarter 1953 rate. The drop was caused by the $2 billion recession in purchases of autos and parts from the second-quarter peak of last year. The annual rate of automotive expenditures for the first quarter was $12 million. This amount, however, exceeded the annual total for any year except 1950 and 1953.

The high rate of residential construction kept the purchases of other consumer durables such as furniture and major household appliances up to those of the preceding quarter.

At an annual rate of $120½ billion, consumer expenditures for nondurables remained the same as the fourth quarter of 1953, following a moderate slipping during the last two quarters of that year. Food and clothing were the primary cause of the earlier reductions.

The remaining groups of nondurable goods have continued stable for the past four quarters.

On a seasonally adjusted basis, the liquidation of business inventories continued in the first quarter of 1954. The

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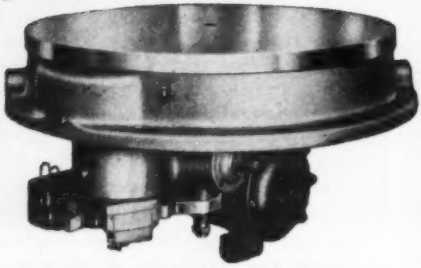

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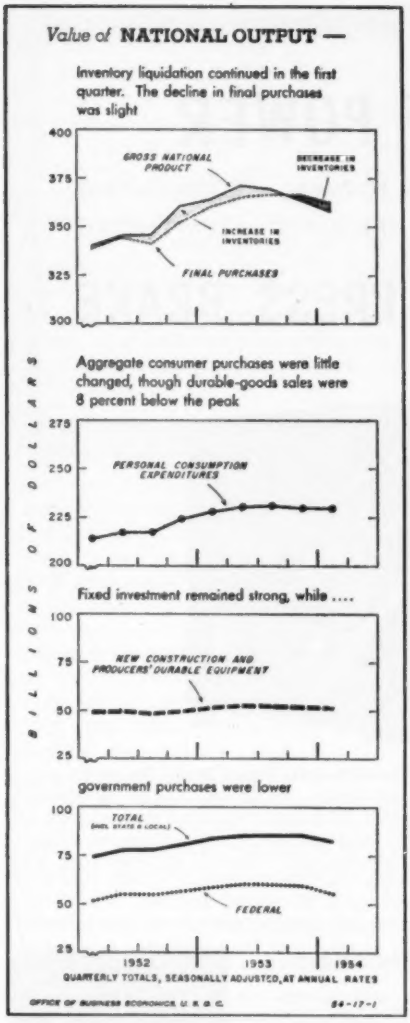

net reduction amounted to about $5 billion at an annual rate, $2 billion more than in the fourth quarter.

Liquidation occurred almost entirely in durable goods. Fabricated metal products and the electrical and general machinery industries accounted for the largest declines in manufacturing. In the primary metal industry, inventory reductions were small, as compared with the appreciable liquidation in the fourth quarter of 1953, the U.S. Dept. of Commerce states.

The largest single decline in the first-quarter distribution of the gross national product was in the combined purchases of federal, state, and local governments. From an annual rate of $85½ billion in the fourth quarter, these purchases fell to $82 billion in the first.

Federal national security expenditures accounted for most of the reduction. Only $47 billion at an annual rate was spent for national security in the first quarter in contrast to $50 billion in the preceding quarter, and $53½ billion in the second quarter of last year, when these expenditures reached their peak. Hard goods and military payrolls were hardest hit by the decline.

Lower agricultural price support outlays resulted in a falling off of other federal government purchases during the first quarter, but only in relation to the unusually high level reached in the latter part of 1953.

A continuing rise was noted in state and local government purchases, reaching an annual rate of $27 billion for the first three months of the year. The expansion was attributed largely to school and highway construction programs, and to an increase in payrolls.

Replacement Requirements

CHICAGO . . . Computed replacement requirements for capital equipment will rise from an estimated $10.4 billion in 1954 to $15 billion in 1960, and in 1975 will be at the $26.7 billion level.

Factors supporting this projected trend of replacement demand are presented in a study by the Machinery and Allied Products Institute on changes in the age composition of the nation's stock of business capital goods. This study, one in a series examining the long-range outlook for capital goods produc-

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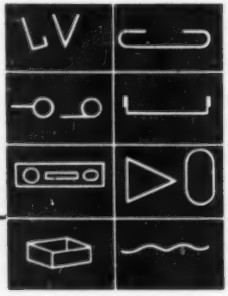

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tion, is presented in the May issue of the Capital Goods Review.

Institute study indicates that 80 per cent of equipment retirements occur in the over ten-year age bracket. The stock of capital equipment has an historic growth rate of about 3 per cent per annum compounded. If this rate continues, the stock of capital equipment over ten years of age will rise from $60 billion currently to $100 billion in 1960 and almost $200 billion in 1975, **more than three times the present amount.** This fact obviously forecasts a continuously rising equipment replacement demand.

SBA Under Fire

WASHINGTON . . . The Small Business Committee of Congress recently issued a rather startling statement. It emphasized that the Small Business Administration "is not yet achieving its potential effectiveness and is not fully carrying out the intent of Congress. This is one of the conclusions drawn by the House of Representatives in its Progress Report of the First Session of the 83rd Congress." Chairman William S. Hill states very frankly that there is considerable dissatisfaction and resentment in Congress and throughout the country concerning the loan program of the Agency, particularly over the prolonged period of time between filing of applications for financial assistance and disbursal or rejection of loans.

"According to the report, the greatest need for credit by small business is in the field of long-term loans with terms of from five to ten years or more. Inability to utilize retained earnings or to attract capital through the securities market has caused small firms to rely on direct borrowing for the purchase of plant and equipment and long-term working capital purposes. The Committee has found in its studies and hearings that the financing channels normally used by large concerns to attract long-term capital are not available to the vast majority of small business enterprises.

"The Committee recommends the transfer of small business specialists from the Department of Defense to the Small Business Administration. The report states that it was clearly the intent of Congress in debate on the SBA bill that the new Agency should centralize all small business programs with the government including those of procurement assistance. The Committee further recommends a return to the greater use of formal advertising of bids rather than negotiation procedures as basic to the more equitable distribution of defense contracts to smaller firms.

"The most persistent small business problem in the area of government procurement during the past year has involved contract specifications of the Armed Forces which, according to the findings, have often been hurriedly written in such a restrictive fashion that only an extremely limited number of bidders could participate."

Government Directory

WASHINGTON . . . The Small Business Administration has announced the publication of the U.S. Government Purchasing Directory, the first complete guide to military and civilian purchasing activities of the Federal Government. The Directory lists over 4000 classes of commodities covering the more than 5 million items purchased by both military and civilian agencies of the U.S. Government, and makes it easy for the business man to learn who in the Federal Government, biggest buyer in the world, buys what and where.

The 92-page Directory is on sale by the Superintendent of Documents, Washington 25, D.C., for 50c. It is designed as a companion to SBA's U.S. Government Specification Directory, now being revised, and which will be available shortly.

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Trends and New Developments In Production Tapping*

By **Harry Conn,**** Chief Engineer
Scully-Jones & Company
Chicago, Ill.

PRODUCTION TAPPING has many things in common with ordinary short run tapping, and yet there are many differences in the design of machines and in the tooling required to perform production tapping on a sound economical and mechanical basis.

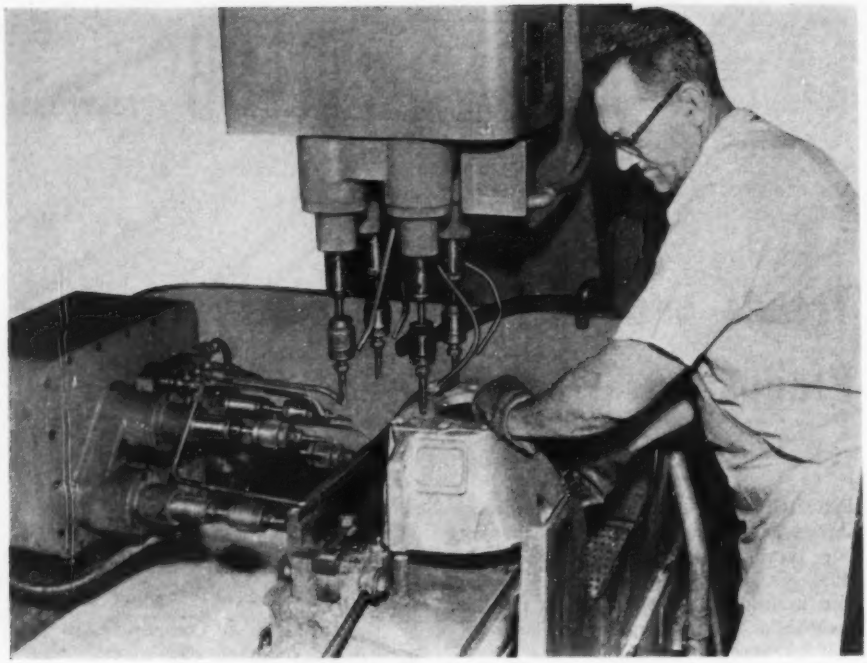
In figure 1, a multiple spindle tapper is shown being used in the automotive field tapping transmission cases. This machine has been in use for over a year and has practically eliminated tap breakage. This machine taps four 5/16"-18 and four 7/16"-14 holes.

Many new ideas and theories have been propounded in the past few months that are tremendous steps forward in improving machine efficiency. For instance, in figures 1 and 6 are shown a new Safe-Torque tap driver. With this tap driver it is possible to hit the bottom of the drilled hole while tapping and not break the tap. Formerly it was standard design practice to specify all tapped holes to be through holes wherever possible. Through holes were always wanted because of the inability to consistently control the torque when bottoming in a blind hole. It has been found that a twist drill will drill approximately 33 percent more holes when it is drilling a blind hole. The drill loses its cutting edge when breaking through; hence, it is a big advantage to be able to bottom tap consistently and increase the holes per grind for the twist drills.

One engine block being machined at this time has 530 machining operations performed on it and approximately 89 tapped holes. It isn't uncommon in short run tapping to break a tap, in fact it has been reported that 90 percent of

*Reprints of this article for handy filing are available.

**Mr. Conn is a member of BLUE BOOK's Editorial Board.



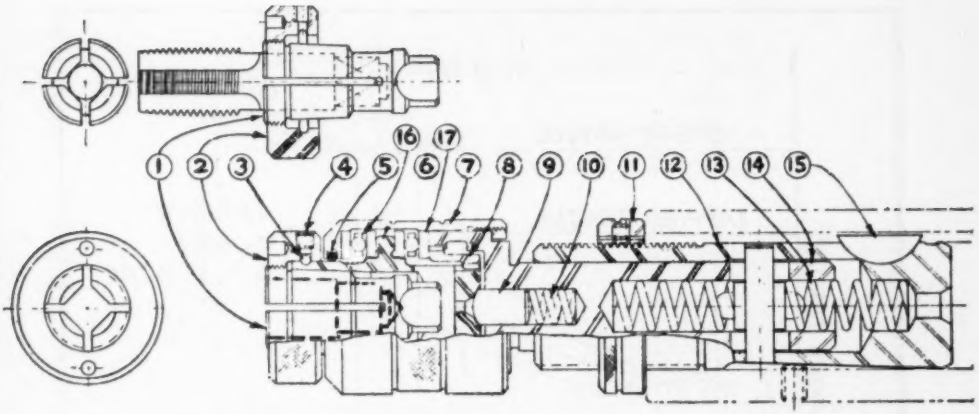
1. A multiple spindle tapper. Four 5/16-18 and four 7/16-14 holes are being tapped. Practically all tap breakage has been eliminated although the machine has been in operation for over a year.

all taps are broken. If the automation types of production machines experienced as much trouble in tapping short run tapping usually encounters, it is safe to venture that they never would amortize their investment. One of the main purposes of this article will be to enumerate the differences between the techniques of ordinary machine tapping and that of production tapping.

A few of the differences are:

1. In production tapping, more thought and preventive measures are exercised to eliminate the packing of chips at the bottom of the hole, which can cause tap breakage. Stations are included to turn the piece part 180° to remove the chips. This must be done automatically and within the cycle time of the machine. It has been found advisable to drill to an increased depth in those machines (like circular table machines) which, due to their design, make it impossible to revolve the part.

2. In production tapping the percentage of thread, the depth of thread and the size and pitch are usually more compatible with good manufacturing practice. This statement is true because more thought is expended by method and design groups on high production commodities than can be justified by the manufacturer of slow moving items. When a firm has a big seller it isn't always because of a terrific sales effort, it can be because it is designed and



2. A Tension and Compression Floating Holder which will correct misalignment in a vertical or a horizontal plane. It will also compensate for the difference of the lead of tap and the lead screw.

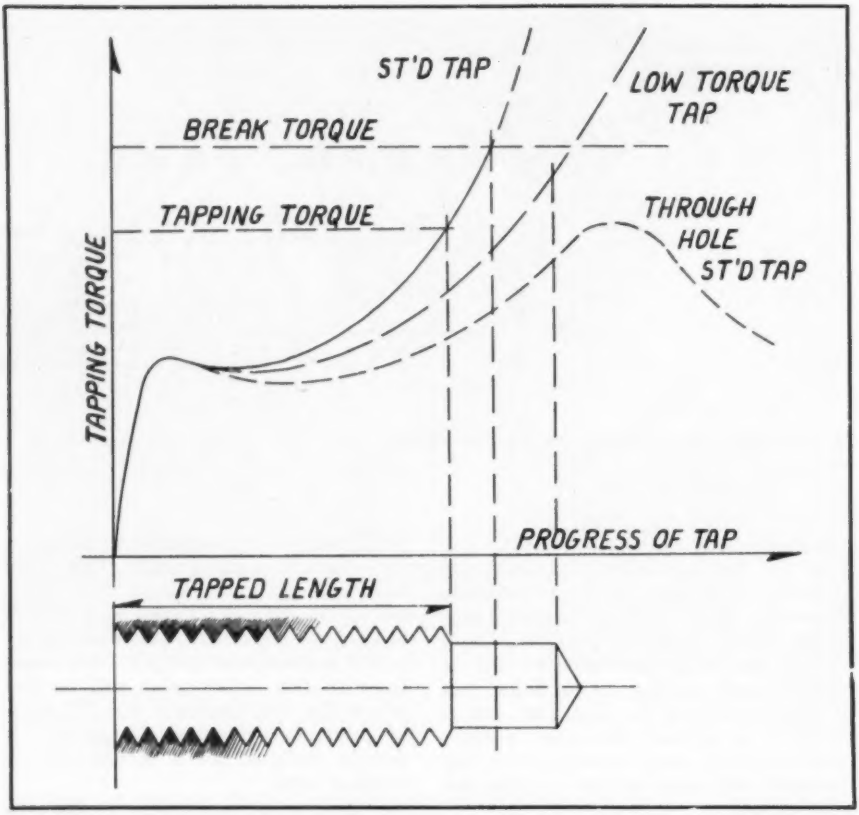
produced very efficiently; usually the hen and the egg are not far apart. To illustrate this point, some automotive firms are eliminating all tapped holes under 5/16" wherever possible. There usually isn't any difference in cost of drilling and tapping 10-24 holes and ⅜"-16 outside of the fact that one is difficult to tap and the other is easy, where there is a difference it is in tool breakage and part salvage cost for the smaller tap.

3. When planning a tapping station and specifying the tooling for a transfer type of machine much thought is given to the size of the tapped hole in relation to its depth. Up to ½"-13 tapped holes, there is a safe depth that a given size of a tap with standard flute length can be safely used in some materials. In short run tapping this fact is usually discovered after many taps have been broken and a few parts scrapped.

4. In short run tapping, it isn't unusual to see a radial drill or a turret lathe operator tapping 10-24 threads in the morning and with the identical machine in the afternoon be seen tapping 1-8. A machine spindle cannot be sensitive enough to tap a 10-24 thread and have enough power to tap 1"-8 holes, nor can it have the power and rigidity to tap 1"-8 thread and also have an inherent sensitiveness to tap 10-24 threads. Later in this article tools will be discussed that will eliminate this difficulty. In production tapping the spindle is usually designed for a certain size or range of taps.

5. In ordinary tapping the problem of not having a hole for the tap to tap doesn't exist, but is a very definite problem in production tapping. In figure 2 is shown the answer to this dilemma which shows a compression feature in the shank of the tool that will facilitate the telescoping of the spindle should there be no hole to tap.

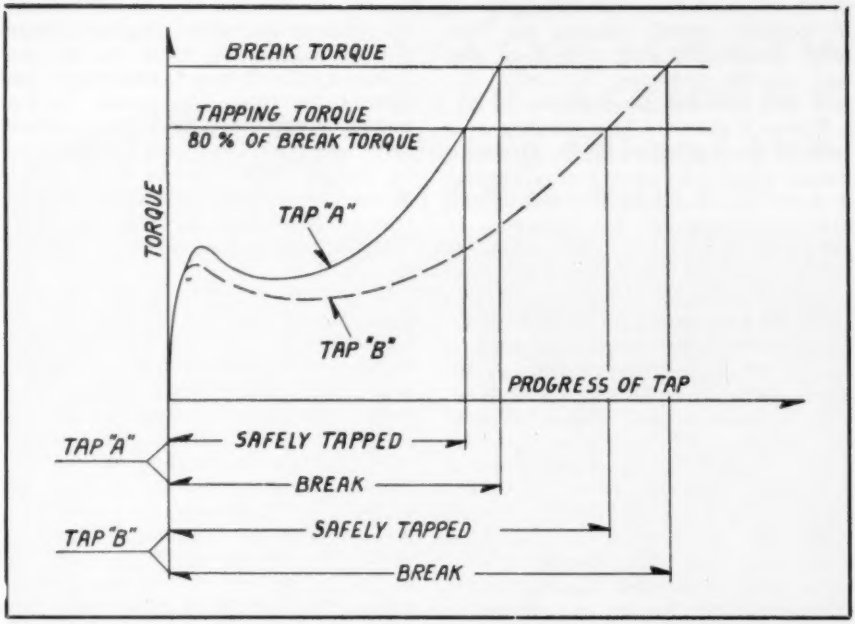
6. In production tapping, misalignment is one of the major difficulties. This is caused by and can be a series of accumulations due to tap shank tolerances, jig borer or boring mill limitation, index error in moving from station to station, expansion of drill head, tapping head or of the piece part, and

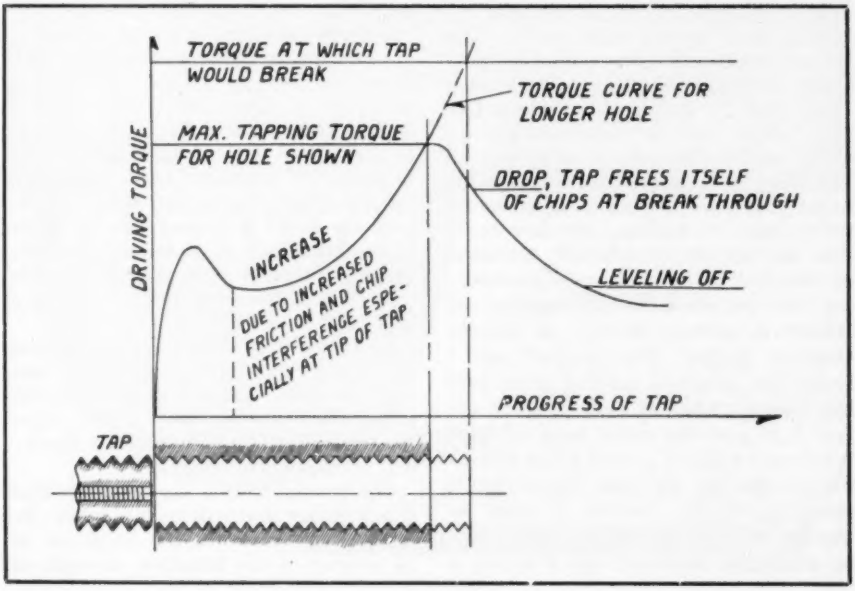


3, 4 and 5. How the depth of a tapped hole, style of tap, chips packing in the bottom of the hole, tapped length or length of flutes in the hole affect the torque.

spindle runout. In short run tapping, misalignment is a problem but is not nearly as serious as it is in production tapping. To eliminate this difficulty in some single spindle tapping machines they will sometimes let the piece part float. If the piece part is heavy and if it is a multiple spindle tapping machine it is always advisable to use floating holders for the taps. For a floating holder to be efficient it should have only a parallel float and the floating members should be divorced from the driving member. A ball cannot drive and float at the same time, a brinelling action will soon be the result and that will restrict the float. Should the alignment between the tap and hole be corrected the torque that is required will be reduced approximately 25% even though there has been only a minor misalignment.

7. In multiple spindle tapping it is imperative that each spindle be equipped with a lead screw; it isn't imperative in short run tapping of the lower classes


BREAK TORQUE
TAPPING TORQUE
80 % OF BREAK TORQUE
TORQUE
TAP "A"
TAP "B"
PROGRESS OF TAP
TAP "A"
SAFELY TAPPED
BREAK
TAP "B"
SAFELY TAPPED
BREAK


TORQUE AT WHICH TAP WOULD BREAK
TORQUE CURVE FOR LONGER HOLE
MAX. TAPPING TORQUE FOR HOLE SHOWN
DRIVING TORQUE
DROP, TAP FREES ITSELF OF CHIPS AT BREAK THROUGH
INCREASE
DUE TO INCREASED FRICTION AND CHIP INTERFERENCE ESPECIALLY AT TIP OF TAP
LEVELING OFF
PROGRESS OF TAP
TAP

of fits where only one spindle is utilized. In multiple spindle tapping the lead screw insures the correct feed or lead and starting pressure. Naturally, the feed and lead are inseparable.

Figure 2 shows a line drawing of a tension and compression floating holder which will correct misalignment in a vertical or a horizontal plane, will also compensate for the difference of the lead of tap and the lead screw. It will also cushion the shock of the stopping and reversing of the tap and also provides adjustment of tap for depth. These holders have adjustable adapter shanks which provide vertical adjustment and a choice of shank and collet sizes to facilitate the various tap sizes and spindles. The float is provided by the double gear spline coupling which features a clearance between the pitch diameters, **6**, **8** and **14**. Their gear teeth have been rounded on the O.D. and along with their pitch diameter clearance allow a parallel floating action between **6** and **14**. The end thrust is provided for by the two rows of standard thrust bearings, **16**. Notice that the floating and driving members are independent of each other, thereby providing full parallel float and avoiding blind spots or angles of non-float. Detail **17** shows four hardened and ground races which eliminate a possibility of brinelling and restriction of float. This holder has a feature which is becoming widespread in tooling; the feature is that the tap can be inserted, tightened or removed by hand, thereby eliminating the pounding of the spindle, or holder. A spanner wrench is usually used to tighten. The knurled nut **2** draws the threaded tapered collet into the holder; it has 16 balls **3** which allow it to pull the collet back or push it forward without a bind when inserting or ejecting the tap. This collet **1**, being removable, makes it easy to change tap size because of various collet sizes. The threaded nut **2** is not a loose piece but can be removed should the occasion ever arise. Chips and other foreign matter are kept out of the holder by the O ring **5**, but it does not restrict the float. The square in the bottom of the collet ensures a positive drive and the collet action compensates for the tap shank tolerance. The collet is assured a positive drive because its tang is driven by the tang slot in **6**. The phantom lines represent the tapping spindle.

In multiple spindle tapping it has been impossible, until recently, to incorporate a torque releasing mechanism that would be small enough in diameter to be used in close center tapping. The torque releasing mechanism was needed so as to be able to bottom tap consistently and not worry about the torque building up and breaking the tap. In planning the tapping stations it is wise to determine the tapping torque required for tapping the depth and size of tapped hole in the material being tapped. This should be done before the machine is built because it may be almost impossible to make the necessary corrections during the tryout period.

In figures 3, 4, and 5 are shown some charts that are purely quantitative, but will give an idea how the depth of a tapped hole, style of tap, chips packing in the bottom of the hole, tapped length or length of flutes in the hole affect the torque. Studies such as these can be and are made to determine the style of tap, breaking torque, releasing torque, depth of tapped hole that is feasible and other factors pertinent to efficient tapping.

In figure 6 is shown a Safe-Torque tap driver; this type of tap driver was used on a part and has tapped 1,000,000 holes. Only two taps were broken during this run; the reason for their breaking has not been determined.

The theory of this tap driver is that it is a holder that will release when the driving torque on the tap builds up to 50 percent of the breaking strength of

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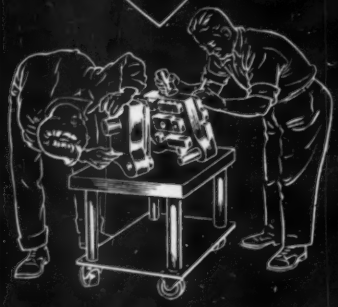

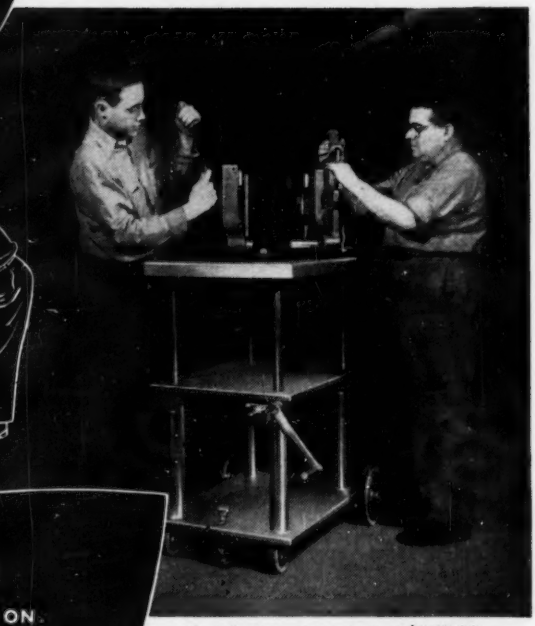

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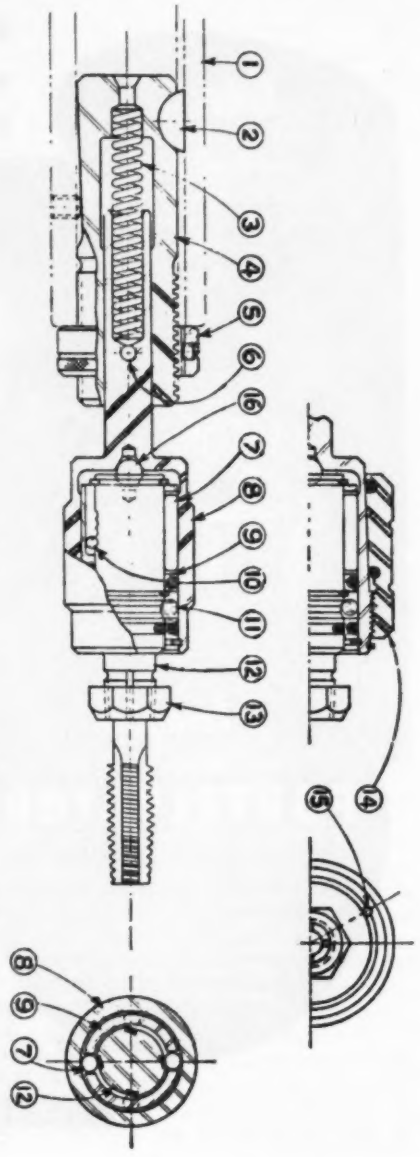
6. A Safe-Torque Tap Driver. This type of tap driver has tapped 1,000,000 holes. Only two taps were broken during this run; the reason for their breaking has not been determined.

the tap. If there isn't any hole to tap due to a broken drill, it will allow the tap to ride around the face of the work and detail 8 will telescope into 4. This will neither break the tap nor damage the tapping spindle and the spring 3 will return the tap and holder to its original projection. Should the drilled hole be drilled ¼ of an inch too shallow or to any degree of shallowness, this tool will telescope after hitting the bottom of the hole and release. The spring 3 will also cushion the shock which is the result of hitting the bottom of the hole; it will also compensate for the lateral projection differences between 4 and 8. This holder will not release every time the tap hits the bottom of the hole, but only when the torque increases to 50 percent of the breaking strength of the tap.

Power is transmitted from the tapping spindle, shown in phantom lines 1, by a Woodruff key 2, to the adjustable adapter shank 4. Power is transmitted from the body 8 to the tap holder 12 by two rollers 7. The tap is held in the holder by tightening the nut 13, which actuates the collet action in 12. The broached square hole in 12 drives the tap. The method of releasing the tap is brought about by the force of the two cammed surfaces on 12 against the rollers 7 that will expand at 50 percent of the breaking strength of the tap, thereby disconnecting the tapping spindle torque from the tap. On high-production-close-center-distance conditions these holders are computed not to have any torque adjustment built in. When the center distances of the spindles permit, an adjusting collar can be incorporated. The adjustment is then obtained by moving the pin 15 and screwing the adjusting collar which naturally changes its lateral position.



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5/16—18	185	250	350
+3/8 —16	285	400	570
7/16—14	370	500	735
+1/2 —13	450	630	900
5/8 —11	650	900	1300
3/4 —10	950	1400	2000
7/8 — 9	1300	1800	2600
1 — 8	1600	2250	3200

+Ratings are based on tests by Iowa State College in their bulletin 123 on "A Study of Torque, etc."

Other ratings are based on a comparative analysis of tests.

"Safe" Torque is based on a 2 to 1 safety factor, "permissible" is based on 70% of "Break."

For tap sizes from 7/16 up the required torque for tapping is generally less than the recommended "Safe" Torque.

7. Approximate torque ratings for 4 flute plug taps.

The outside diameter of the body **8**, when the tap driver is an adjustable torque type, has a slight taper which corresponds to the internal taper of the adjustable collar **14**. The torque adjustment is determined by the amount of clearance between the O.D. of the body and the I.D. of the collar, because the collar either allows expansion of the shell-like body or restricts it in accordance with the adjustment.

When the holder releases and the spindle reverses, the rollers are then reset by two balls, **10**, and the rollers are again used by the outer body **8** to drive the cam drive collet **12** in a reverse revolving direction which naturally removes the tap from the hole. The centrifugal motion of the body when reversed to a cutting direction will then reset the rollers to a driving position. The rollers are held in opposite positions by the cage **9**, and the cage and balls are for direction and position. The cam path for the balls has not been shown. The tap driver is also made with taper shanks with a built-in compression feature.

The concentricity between the cam drive collet **12** and the body **8** is maintained by **14** balls, **11**, and the ball **16**. There isn't any lateral movement between the body and the cam drive collet.

By describing the tap driver an attempt has been made to show how sensitiveness, power, depth error compensations, lead screw and tap lead differences can be reconciled and the correct torque capacity can be designed and incorporated into a machine. Naturally, this can only be done after a lot of thought and various factors have been considered and analyzed such as material, depth, pitch, class of fit, percentage of thread, style of tap, speed, size, chips and tap life.

When planning a tapping station the information contained in figure **7** is very necessary and most certainly helpful. A tap can be used at the same surface speed as the metal is drilled and sometimes several times faster than drilling speeds, provided the many aspects of tapping are considered and provided for.

The End

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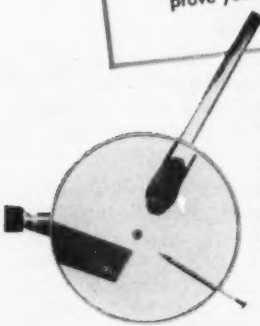

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Reclaiming Overmachined Parts With Electroless Plating

By **Frank Charity**

SOME OVERMACHINED parts have been reclaimed by using metallizing guns, welding equipment, and electroplating facilities to replace metals removed by excessive machining. But, aside from the fact that they generally necessitate a sacrifice of quality, these methods cannot be adapted to the repair of all overmachined parts.

Therefore, considerable interest has recently been aroused by the development of an "electroless" plating process which apparently eliminates many of the deficiencies of other reclamation methods.

Electroless plating is, briefly, a chemical reduction technique which permits the precision deposition of nickel and other materials on metal surfaces without utilizing electrical current. Compared with electroplating methods, it has the principal advantage of permitting the uniform deposition of plating materials in small holes and other areas which could not otherwise be coated due to the inadequate "throwing power" of electroplating equipment; the principal disadvantage of being a bit too expensive for routine production finishing operations.

Coatings deposited by electroless solutions have more than enough bond strength to permit supplemental machining. But in many cases, they don't have to be machined because their uniform thicknesses can be maintained within tolerances of plus-minus 0.00001".

Abner Brenner and Grace Riddell of the National Bureau of Standards developed what was probably the first practical electroless plating method in 1946, after accidentally learning how to inhibit the spontaneous reduction of nickel salt in solution so that nothing more than a desirable catalytic action would occur. It involved the reduction of the salt by means of hypophosphites in a heated solution—composition and temperature of which were carefully

controlled in order to avoid filling the bath with "black" nickel.

In a solution of the latter type, the material to be plated frequently serves as the catalyst that causes the nickel to be deposited on its surfaces. However, non-catalytic materials can be plated if they are brought in contact with metals that are appropriately electronegative or if they are first immersed in a solution containing a catalytic metal such as palladium.

Since Brenner and Riddell announced their development, a number of companies—both large and small—have reported success in plating materials other than nickel on both metallic and nonmetallic surfaces. It is impossible to evaluate most of these processes directly; for, due no doubt to the need for trade secrecy, little is known with regard to their technological nature.

However, it is possible to determine the general advantages of electroless processes by reviewing work that has been accomplished in the nickel plating field—by firms like General American Transportation Corp., Chicago; Metal Processing Co., Cedar Grove, N.J.; and Chemplate Co., Los Angeles.

Materials to be electrolessly nickel plated are first carefully cleaned, much the same as if they were to be electroplated—that is, by immersion in an emulsion cleaner, acid solutions, an alkali bath, and a cold-water rinse. Then the materials are placed in the plating solution, which is heated to about 210° F. in order to accelerate the deposition of nickel.

Both acid and alkaline solutions have been used as electroless nickel plating baths, but most processors now seem to prefer an acid bath of the type developed by Brenner and Riddell. The latter comprises:

Ingredient	Oz. per Gal.
Nickel chloride	4.
Sodium hypophosphite	1.3
Sodium hydroxyacetate	6.7
Brighteners	Optional

With a solution of this type, a pH in the range of 4.0 to 6 is usually considered best for a maximum plating rate—that is, up to about 0.0005" per hour.

The best yield obtained by Brenner and Riddell, based on the conversion of hypophosphite to phosphite, was 37%. In other words, about 5.5 lbs. of sodium hypophosphite salt were required to deposit each pound of plating. As a rule, the capacity of the bath was such that no more than 0.5 sq. ft. of material could be satisfactorily plated by each gallon of solution.

Overmachined parts have long been considered a major business hazard among companies manufacturing precision metal products, since they represent a loss of many hours of work as well as many pounds of expensive materials.

Nickel plated components are removed from a heated electroless plating bath.

Because no deposition current is required to apply nickel electrolessly, it might seem reasonable to assume that this process can save substantial sums by greatly reducing power costs. However, all authorities agree that electroless work costs more than electroplating because:

(a) The plating baths cannot be used for long periods of time like electroplating solutions.

(b) Considerable power is required to heat and mechanically agitate electroless solutions, if a maximum deposition rate is to be maintained.

(c) The pH, temperature, and purity of electroless solutions must be controlled with relative precision.

Nevertheless, it is possible to use electroless facilities in place of electroplating equipment for some production finishing operations. For example, thanks to the aforementioned throwing power, both the inner and outer surfaces of small tubes can be electrolessly plated where only the outer surfaces could be electroplated.

Where it has been necessary to reclaim overmachined parts, extremely uniform electroless coatings have been deposited in holes less than 1/16" in diameter through more than six inches of solid metal.

There is no general need for reclamation coatings thicker than 0.013", although heavier layers of materials can be electrolessly built up if necessary.

Standard qualitative tests have consistently shown that the adhesion of electroless nickel coatings to brass and steel surfaces exceeds 50,000 p.s.i. This

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is due to the fact that electroless plating establishes both chemical and mechanical bonds between coatings and deposition surfaces which are much stronger than the bonds normally produced with electrodeposition equipment.

In the as-plated condition, the only physical deficiency of an electroless nickel coating is relative brittleness. This can be eliminated, if necessary, by heating the parts to about 1100° F. for a short period of time. Higher temperatures tend to reduce the surface hardness as well as the brittleness of the nickel coatings, while lower temperatures tend to increase hardness without affecting brittleness.

Because brightness has nothing to do with the basic properties of electroless coatings, dull or semi-bright finishes are usually applied for reclamation purposes. However, it is possible to produce an electroless nickel coating with as much brightness as first-quality chrome plating.

In fact, a number of companies now specify bright electroless coatings in place of chrome plating on steel molds and dies because the nickel coatings—in addition to being more durable—have superior lubricity.

Due to the need for relatively-hot plating solutions, parts to be processed with electroless equipment cannot be masked in a conventional manner where limited areas must be plated. However, engineers at the aforementioned Chemplate Company have made satisfactory use of heat-resistant organic masking media for electroless finishing purposes.

Most of the materials being electrolessly plated at present are metals—usually ferrous and copper alloys, although aluminum alloys are being electrolessly nickel finished in some circumstances so that they can be soldered or brazed with acid and resin core solders.

There seems to be no special point in electrolessly finishing most nonmetallic materials. However, chemically reduced coatings of silver have been used in some circumstances to make nonmetallic articles conductive for electroplating purposes. Also, semi-conductors such as graphite and silicon carbon have been coated with nickel by bringing them in contact with a steel catalytic agent in an electroless plating solution.

The End.

Electroless plating necessitates the daily testing of processing solutions for laboratory facilities, because the plating baths cannot be used indefinitely as can electroplating solutions.

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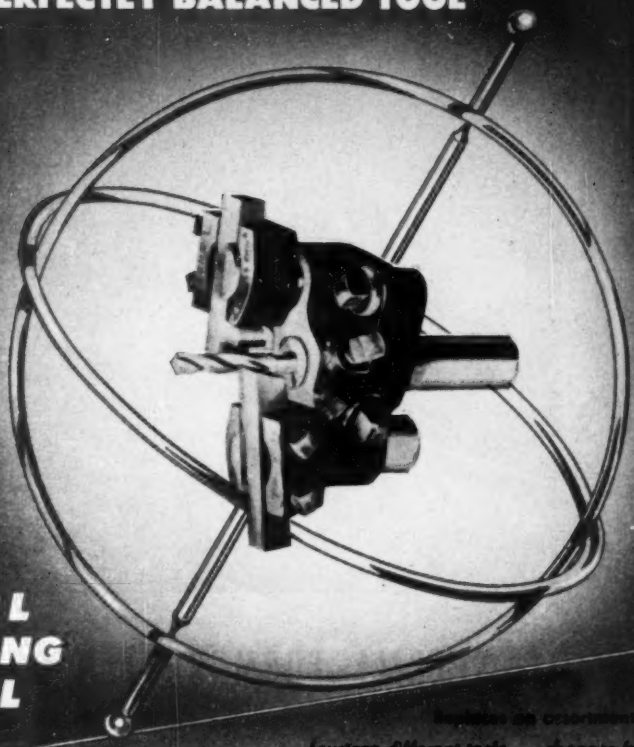

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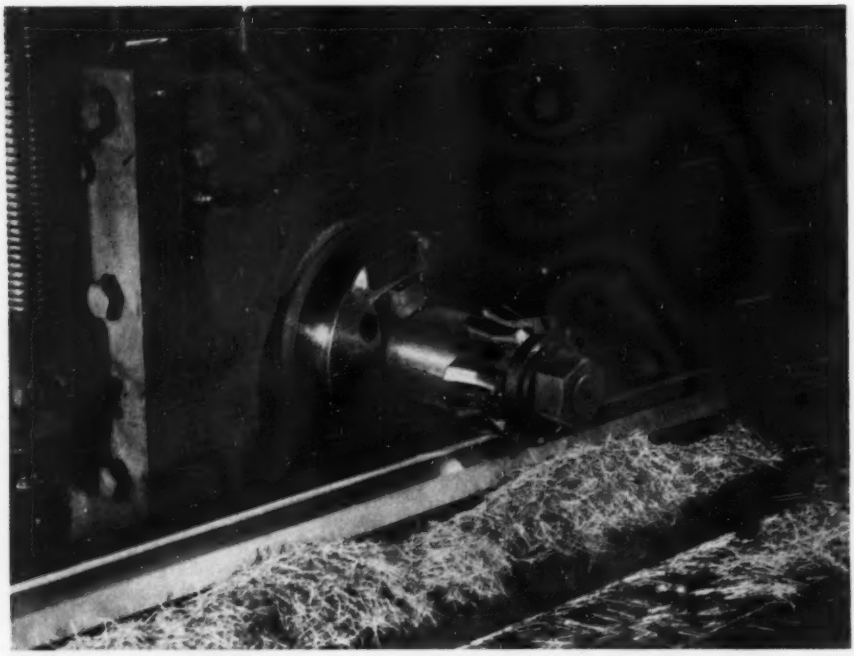

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The accuracy of the form on these ways is built into the cutter. The form on this ground cutter must fit the layout within .0005". By simply sharpening the cutter accurately across the faces of the teeth, this accuracy can be maintained throughout the life of the cutter. The only adjustment required in setting up the machine is to true the cutter on the arbor. The cutter is designed with fourteen teeth on a 4" diameter to provide the fine finish required on these ways.

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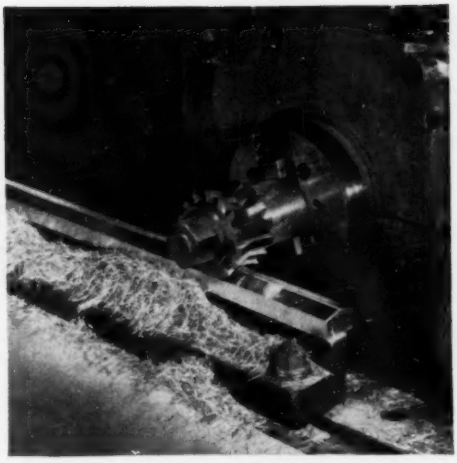

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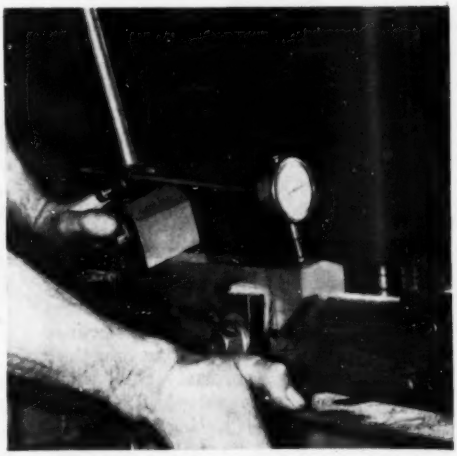

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METAL CUTTING TOOLS SINCE 1908

Two Operations at Torrance:
. . . Deep Hole Drilling
. . . Safe Milling

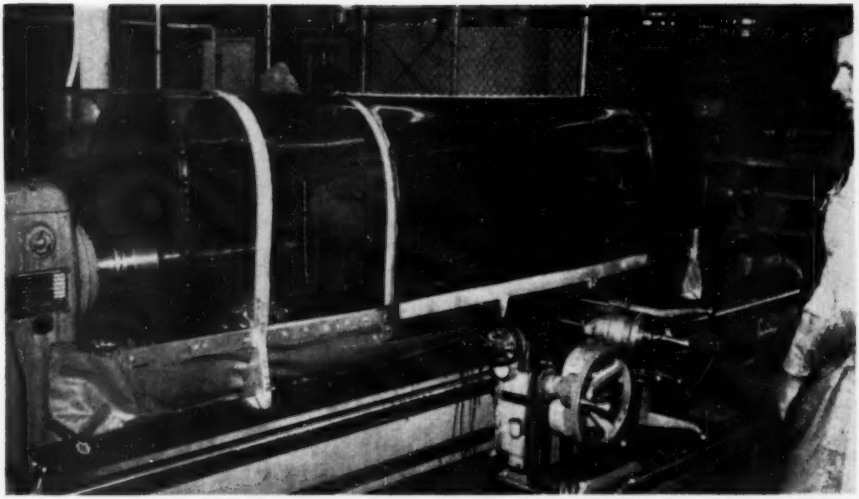
By **Clifford Clayton**
General Foreman
El Segundo Div. Douglas Aircraft
Torrance, Calif.

AT DOUGLAS Aircraft's facility in Torrance, California, operated by the company's El Segundo Division, one production item required a three inch diameter hole, thirty inches long, in a solid. The job looked costly from the beginning. Twist drills in large sizes are always expensive. Because of the length of the hole, standard drills were not available. That meant drilling from each end, undersize of course, because the drill cannot guarantee size, and then a series of borings to size.

Sometimes scrap resulted. The piece was hard to chuck. Chatter, and its resulting poor surface, increased in almost direct ratio to the length of the cut. Undercutting could develop from loading. Tool life was short. And the job ate up a couple of hours and tied up equipment too long.

This changed when a modern version of the old, deep-hole gun boring technique was adapted with a modern production tool. On a 20" Monarch lathe, a Superior Target drill was mounted in the chuck. The round solid was secured in a fixture that mounted on the cross-feed. With the cross-feed locked in place, except for longitudinal traverse, the chuck rotated the target drill through the work.

The set-up is called the "apple-corer" in the shop and very naturally, for the cutting tool of carbide rotates around a core it develops. This core, always fast to the parent metal at the point of cutting, assures a perfect steady-rest or support at the exact place it is needed. Cutting fluid under pressure flushes out the borings without a chance of work loading and the chatter-free



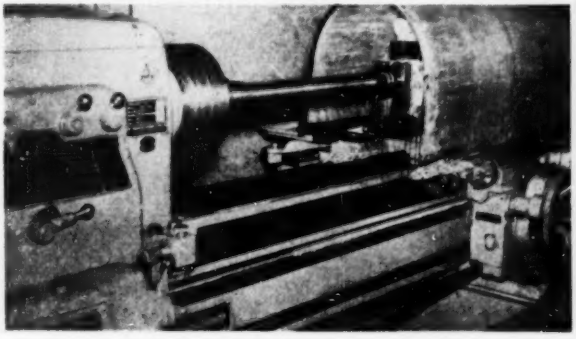
The complete operation of this lathe with the Superior target drill is enclosed in a Safety Plastic cover.

operation delivers a finish requiring no further machine time.

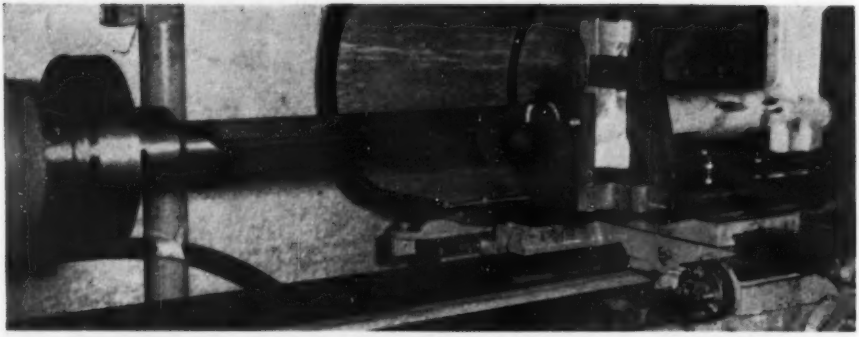
Rejections have been so few they are negligible, possibly because dimensional errors in the 30" length are less than .002". The time factor saving on the boring alone is 300%. Tool savings permit a quick write-off of the original investment, for the cutting carbide tips have a work life of more than two shifts between dressing.

We also have some multi-station milling machines which really are standard milling machines with just a few changes—they are run by higher powered motors; they have 720 cycles of operation; they are equipped with a safety-stop midway between the operating stations; and they have positive control.

These mills have bed lengths varying from 48" to 72". These lengths antici-



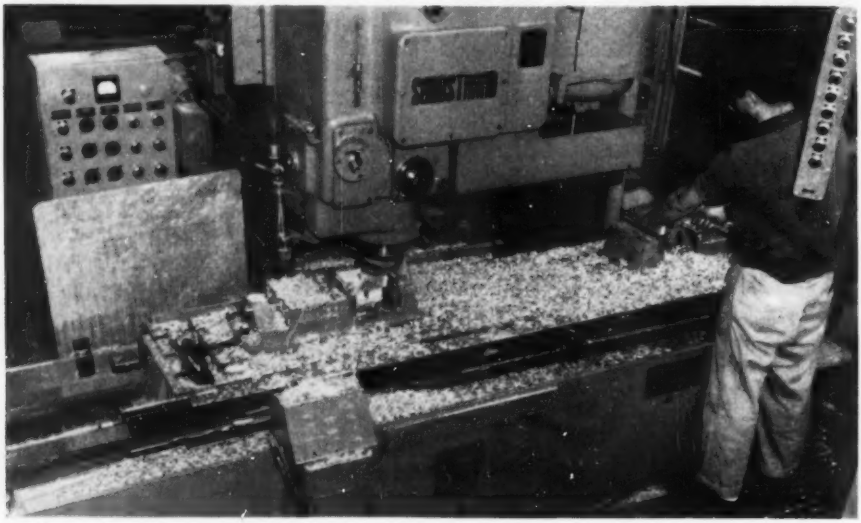
The operation of the "apple corer" in view with the Safety Cover rolled back. This operation removes one cubic inch of material per H.P. per minute.

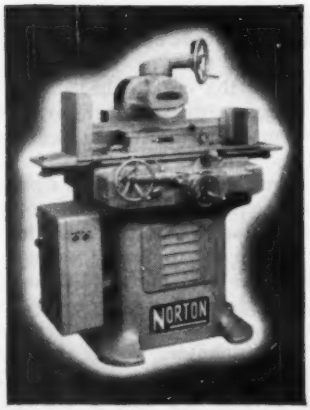


Close-up of the fixture holding the part to be bored. The fixture incorporates not only a holding fixture for the part but also a drilling jig for the drilling operation. The chuck drives the drill while the lead screw feeds the work.

pate the continuance of the trend to larger airplanes and thus larger parts. The larger electrical motors anticipate the added power that will be needed for deeper cuts in harder metals than are used today. That power must be inherent to the machine to have the cycling features we considered necessary—we demanded rapid travel, we wished to ease into the cut but we

Typical multi-station milling operation on a Sundstrand. The cutting head in this installation keeps its stationary position and the bed traverses with the stop midway between work locations.





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wanted a quick full cut as soon as possible, then we wanted that cutter to climb off the work fast. These demands required power to get in and dig, but they also required positive control to energize the movements.

The machines have 720 cycles of operation and at present we use only 35. On the surface, the machines appear too versatile but that isn't so. We are adding to our knowledge every working day. In another year we may be using 75 of those cycles and in the meantime they cost no overhead waiting for us.

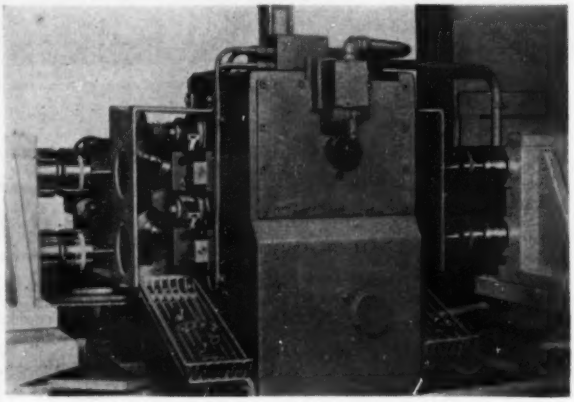
At work, the operator loads one location while the work on the other end is cutting. At the conclusion of the work cycle, the cutting head withdraws from the work and travels toward the opposite end. Midway between, however, the safety-stop operates and the cutter head will not approach the new work until the operator pushes the release button. This is a precaution that will satisfy any safety department. Any number of things could take the operator's attention at the critical moment of approach and, but for the safety-stop, the least that could happen would be a ruined part or tool. With the safety-stop, the cutting head stays beyond danger until the operator finishes the set-up or comes back to his machine.

This multi-station mill has its working head cutting almost constantly. It is not resting while the operator reloads. But even that isn't enough for the machines of tomorrow. When production lends itself we introduce package lots of similar parts that are placed in an Airlox holder and a number of parts are machined at one pass. This Airlox holder also has a Douglas-suggested safety feature: a check valve is now a part of the vise which will retain air pressure in the vise should the pressure of the air line drop. Of course, once released, the fixture will not operate without a full head of pressure but the danger factor, where an airvise could release the parts while in a machining cycle, is eliminated.

The End

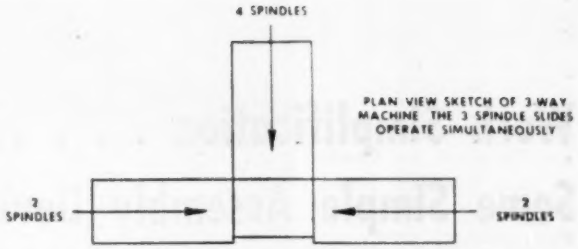
3-Way Machine Nets 822 Pieces Per Hour

A 3-WAY precision boring machine designed and built by Ex-Cell-O Corporation precision bores two angular holes in die cast aluminum automotive parts at the rate of 822 pieces per hour. One hole 13/16″ in diameter is bored through. The second hole, 5/16″ in diameter, is a blind hole and is perpendicular to the



Two parts are held on each side of the fixture. Spindles on left and right slides bore the larger hole in each part, while spindles on the rear slide bore the smaller holes.

Plan view sketch of 3-way machine. The three spindle slides operate simultaneously.



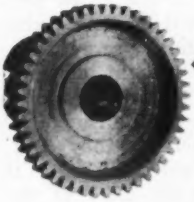
first. Limits on diameters are plus or minus .0005".

The machine consists of three standard, self-contained way units joined to a fixture section. The left and right way units have two spindles each, mounted one above the other on angle plate brackets. The rear way unit carries four spindles, two on each side. The fixture accommodates two parts on each side.

The operator loads 4 parts, presses the clamp button, then the start button. All three spindle slides advance simultaneously, boring the two holes in each of the four parts. As the slides withdraw the work is unclamped and ejected automatically, completing the machine cycle.

The End.

Two finished workpieces. Arrows point to the holes bored on the 3-way machine.



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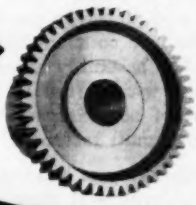
AFTER PRESSURE BLASTING



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Work Simplification . . . . Some Simple Assembly Devices

By **C. T. Bower,** Consulting Tool Engineer

IT is difficult to generalize on the equipment used in various assembly processes since most of them require that apparatus be specially developed to suit each particular job, but as most assemblies include nuts, bolts, washers, rivets and pins which have to be picked up and placed in position, they will behave in a constant manner, irrespective of the assembly upon which they are being used. What follows is a description of some simple methods of handling small fasteners.

Assembly of headed fasteners is eased considerably if they are presented for picking up with their heads all pointing in one direction. It is a fortunate peculiarity of such fasteners that if they are permitted to trickle on to the surface of a board which is inclined to the horizontal, they will come to rest with their heads pointing down the slope, as illustrated in figure 1, which shows an assortment of rivets and screws behaving in this manner.

Inclination of the board need not exceed 10 degrees from the horizontal and if its surface is smooth and hard, the slope can be much shallower. The board arrangement is very useful if there is sufficient space for it on the assembly bench. Where space is restricted and only one size of headed screw is to be used at a time, another compact arrangement is to make a V-shaped trough with an opening at the bottom of the V. If the screw storage pan is arranged with its lip overhanging one side of the V, screws can be pushed into the trough indiscriminately and if the fingers of one hand are run up and down the trough a few times over the screws, they will all eventually hang vertically with their heads resting on the sides of the V and their threaded ends projecting through the trough bottom.

Most screws used in assembly need to have a washer fitted under their heads before insertion into their holes and a simple method of picking up a washer by means of the actual screw is shown in figure 2. Here, the washers are laid out flat on the surface of a piece of semi-hard rubber. The screw is grasped by the head between the fingers, as shown, or can be held by the magnetic end of a power screw driver. The screw end is pushed down into the central hole of a washer for

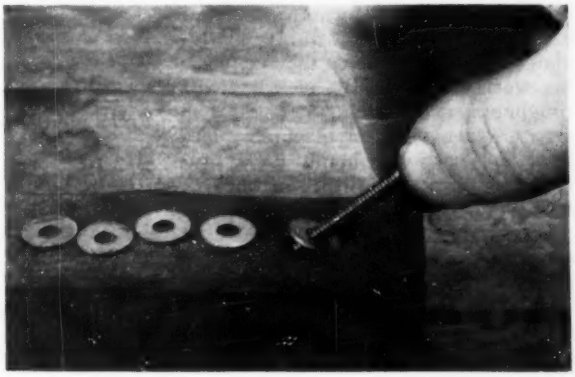
1. When fasteners are tossed on an inclined board they will come to rest with their heads pointing down the slope. This facilitates pick-up.

a short distance, compressing the rubber. A sideways tilt imparted to the screw will then tend to pick up the washer which can be slid along into contact with the underside of the screw head by merely pointing the screw head upward.

Insertion of short nails and self-tapping screws is often a problem owing to their shortness precluding a good hold for the fingers while they are given a true start into the material. A pair of tweezers, as shown in figure 4, is a good way to hold these short fasteners upright. The tweezers can be modified in various ways to suit the work; for instance, a slight groove filed in each gripping face will engage with the nails shown and prevent them from slipping sideways. A further useful modification of such tweezers is to solder finger loops on to them so that they can be held firmly without fumbling.

In cases where long lengths of joint are to be nailed down with short pins, the tweezers and the wrist magnet for holding the supply of pins make an excellent combination for speeding up assembly work.

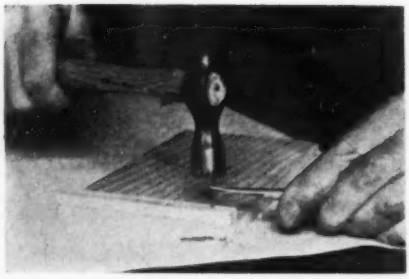
Where numerous small parts are assembled to a relatively large object, such as a casting, it is usual to provide some means for locking the casting to the assembly bench. Some very elabor-



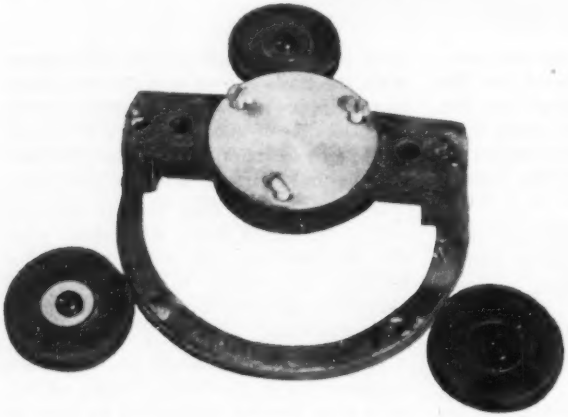
2. When washers are laid flat on a soft rubber pad they are easily slid on to the bolt.

ate and expensive clamping means have been evolved for work holding and the more irregular the work the more complicated have been the clamping devices.

A quick method of securing a casting against rotation and one which will accommodate itself readily to irregularities of shape and size is illustrated in figure 5. The holding method comprises three tough rubber discs, each secured to the bench top by a central screw and washer. The casting can be forced into the grip of the discs which will hold it against rotation caused by the screw drivers and nut runners used on the job. It might be mentioned that these rubber discs form an excellent means for locating castings on face plates and the like since they centralize the work automatically, irrespective of roughness or departures from symmetry. When used for machining location, the castings should have other clamping means to lock them to the face plate.



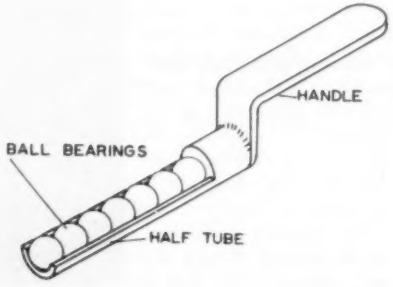
3. Short nails can be easily held with a pair of tweezers.



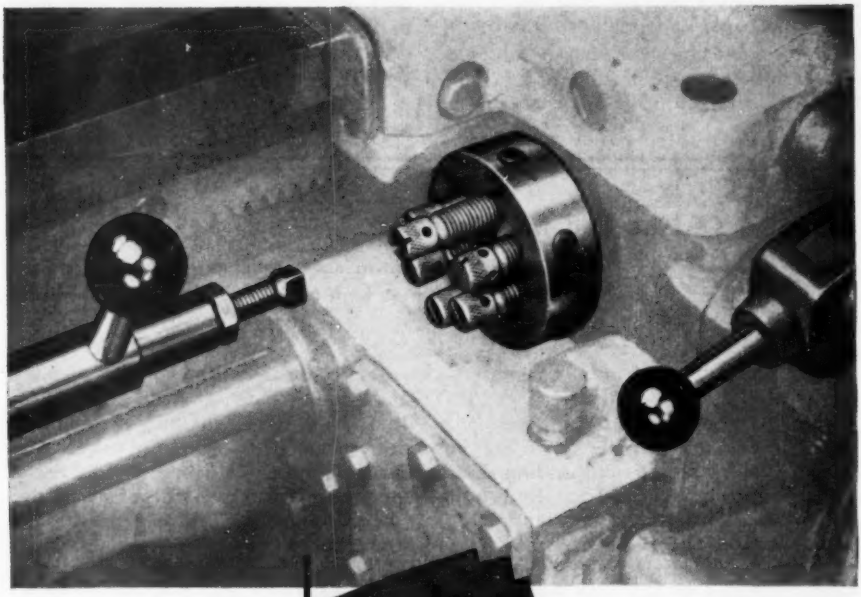
4. Three rubber discs hold awkward castings in place when nut running or similar operations are performed on the casting.

Counting out a specific number of steel balls is a task which has exercised a lot of minds. The simplest possible way of doing this job is illustrated in figure 6. The ball counter is in the form of a semi-cylindrical spoon formed from

5. A trick used in the bicycle industry is to make a shovel which will hold the desired number of ball bearings.



Operators do better on a J&L turret lathe



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a piece of metal tubing whose bore is equal to the diameters of the balls to be counted. The length of the semi-cylindrical portion is such that the required number of balls will fill it exactly. One ball too many will fall off.

In use, the operator merely plunges the spoon into a bin full of balls and lifts it vertically bringing the correct number out of the bin, all excess balls falling off the spoon and back into the bin. The contents of the spoon can be tipped directly into the race or other part of the assembly which they have to fill, without any intermediate handling. This is one of the methods used widely in the assembly of bicycles.

The End.

Titanium Carbide Rod Mill Guides

Rod mill guides utilizing Kentanium guide inserts show a wear-life ratio as high as 45 to 1 over previously used materials.

TINY pieces of preformed, sintered titanium carbide (approximately ¼ x 1 x 3 inches overall) used today for rod mill guide-inserts are proving to be one of the industry's most outstanding cost cutters of the last decade. Rod mill yields are being upped substantially—in many cases to 2 per cent; production downtime is decreasing, and scrap generation reduced 80 per cent in addition to improving the finished rod's cross-sectional accuracy and surface finish. These inserts, developed jointly over an 18-month period by engineers of both Kennametal Inc., Latrobe, Pa., and one of the country's largest rod producers, are giving exceptional performance in mills rolling AISI 1010, 1020 and various other grades of wire alloy rods.

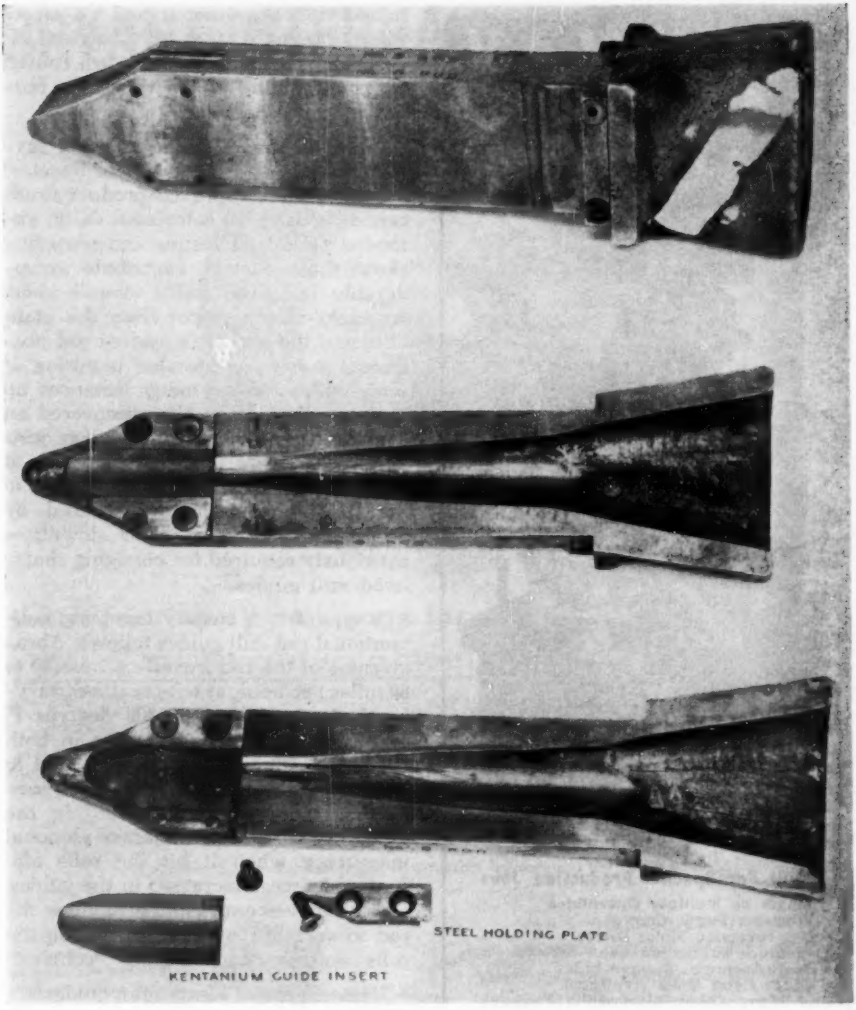
Mill downtime usually occasioned by too frequent guide changes has been substantially decreased due to the material's long wear-life. It is not unusual for operators to now go from 200 to 310 hours between guide regrinds. Conventional guide materials normally require replacement and/or regrinding in from 3 to 10 hours of mill operation—10 hours being the maximum rather than the norm.

As a matter of interest, a set of these titanium carbide guides, which had been reground eight times, produced an average run of 200 hours per regrind for 1600 hours effective guide life. Scrap being reduced to one-fifth of its former quantity, along with the aforementioned production benefits, constitute a considerable economy which today's progressive rod mill operators are not overlooking.

Unusual properties of this new material, (Kentanium—a member of the Kennametal family of sintered carbides) make it especially adaptable for handling red-hot rod through the finishing stands of today's high speed mills at 5000-5200 feet per minute as well as in lower speed mills at 3200-3500 feet per minute. Until the advent of Kentanium, rod mill operators advise they never encountered a guide insert material that proved satisfactory for the purpose—including the modern-day tungsten carbides, cast alloys and high-speed steels.

Costly Mill "Cobbles" Eliminated

These guide inserts show a wear-ratio as high as 45 to 1 over previously



A typical rod mill guide.
Guide half with Kentanium insert in place.
Disassembled view of guide half.

used material. Kentanium's characteristics of non-galling, resistance to both abrasion-under-heat and shock, lends it to immediate application for hot-wear surfaces where general purpose materials generally fail. Its semi-lubricating action prevents less tendency to drag or pickup, permitting mills to produce higher tonnages due to lessened downtime; also both product finish and cross-sectional accuracy are vastly improved. One of the vexing problems encountered

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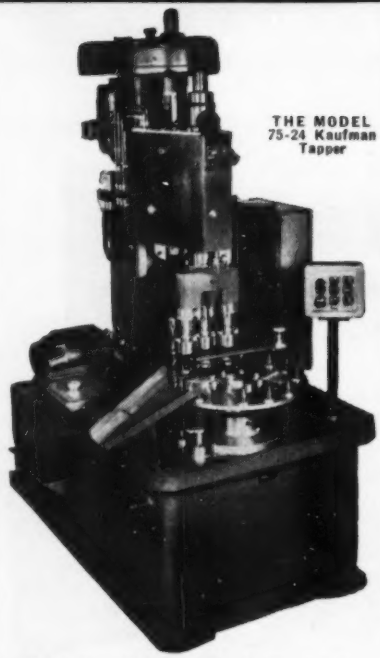

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in rod mill operation solved by use of these inserts is that of "tangles" or "cobbles" which quite often are caused by poor guiding of the travelling red-hot rod into the rolls.

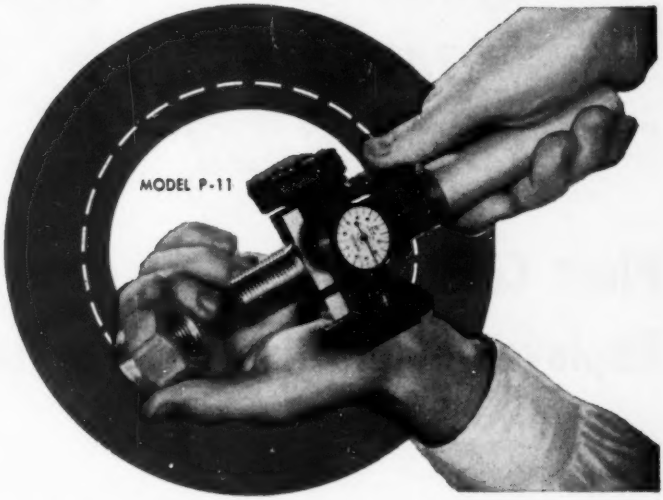
While the exact dollar value of savings produced as the result of lessened downtime and improved product finish cannot usually be calculated daily, extended periods of testing and recording show these factors contribute considerably to a rod mill's overall yield. An eight-month report from the plant of one of the country's leading rod producers shows considerable bettering of their mill yield—in many instances up to 2 per cent. They also discovered an average net savings in production costs of from $2.25 to $2.75 on each ton of rod produced per 8-hour shift, due to the increased production secured by eliminating much of their downtime previously required for changing short-lived mill guides.

A typical case history involving conventional rod mill guides follows: Abrasiveness of the rod travelling from 40 to 60 miles per hour, at temperatures varying between 1600 and 1800 degrees F, readily caused excessive wear in both brass and alloy guides. They tended to wear in the guiding contact faces permitting the rod to "lay-over" in the guide, which produced a cross-sectional inaccuracy when it hit the rolls off-center. As wear increased in the guides, enough movement resulted to allow the rod to veer off to one side missing the rolls entirely and causing "cobbles."

Maintenance of Kentanium guides are relatively simple. All that's required is a simplified machine shop setup where the inserts are easily ground to desired size and finish in approximately 10 minutes per piece. As expensive diamond grinding wheels are not required, these inserts lend themselves to ease and economy of maintenance.

The End.

BRYANT INTERNAL THREAD GAGE



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Foremanship Forum

Plant Communications . . . Employee Publications and Other Devices

By **Edmund Mottershead,** President
Mottershead Associates
Chicago, Ill.

ONCE we've established that building good human relations and a positive worker morale is one of the definite objectives of industrial communications, we find that we've assigned ourselves a great deal of ground to cover. We now have to deal with certain aspects of the plant's functioning that are not always considered integral parts of the communications problem.

These are what we might call the auxiliary "tools" or "devices" of communications. They are **aids** to good communication many of them absolutely essential to the success of any modern system. They, more directly than any other means at the disposal of management, can do a permanently effective job of promoting understanding and a feeling of comradeship among all plant personnel.

Internal House Organ

The first and perhaps most important of these "auxiliary devices" is the employee house organ. The house organ idea has come to be accepted by plants throughout the country. These papers are fast becoming the rule rather than the exception in American industry.

Let us not leap to the conclusion, however, that there is no problem to be faced here—that there is little, if any, room for improvement. Let's face it: the mere existence of an employee paper by no means signifies that the human relations function is being effectively carried out. There are ineffective — even harmful — house organs being regularly published and widely read.

And the publication with a large budget and a full time editorial staff can turn out just as badly as the mimeographed first effort of a small concern. More can be said in a large, slick house organ, it is true, but it is

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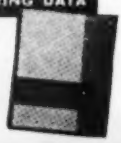

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what we say and **how** we say it that determines the effectiveness of the human relations job.

Depending on the organization and needs of the particular plant, a monthly or bi-weekly newspaper might be the best choice. In some situations, a monthly magazine will do the best job. The size of the publication depends primarily on the size and scope of operations of the particular plant.

There are, however, certain basic principles underlying the planning, organization, and publication of house organs—principles that apply equally to all situations:

The house organ should be published on time—every time. Nothing so quickly stamps a publication "bush league" or "amateur" as irregular appearance on the "newsstand." Permanent readership interest on the part of employees is impossible to develop unless the house organ consistently is distributed on the announced date of publication—and this applies to bi-weeklies as well as monthlies, magazine as well as newspaper types.

As many mentions and pictures of employees should appear as space, budget, and professional standards will allow. Though we don't always admit it, we are all egotists enough to like to see our names and pictures in print. There's a definite prestige value involved for the individual, and enough of this kind of recognition will cumulatively lead to increased respect and appreciation for the house organ.

An obvious point, but one that merits constant emphasis, is that individuals have to be identified correctly and names have to be spelled accurately—**every time.** A little carelessness in this respect—in reporting or proofreading—will alienate the particular individuals involved and lower the general worker estimate of the reliability of your publication.

Contests, letters-to-the-editor col-

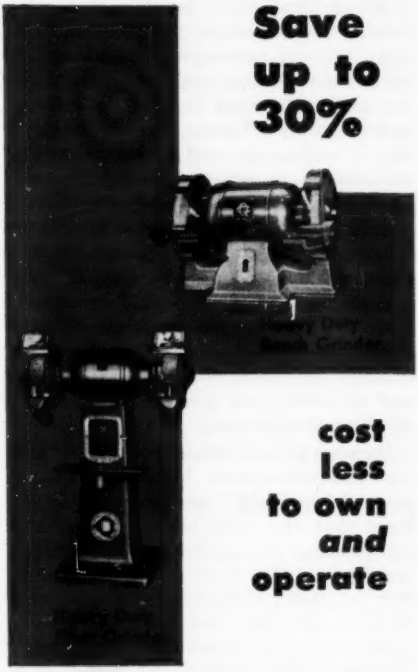
umns, and the "inquiring reporter" type features, utilized in various ways, are excellent means of "getting the worker into the act." Here again, the particular treatment should vary with the aims and structure of the individual plant and publication.

And along this line, a "must" for all house organs is ample playing up of any organized plant recreational and sports activities. These offer ideal opportunities for good pictures, too.

Ridicule, in any form, should always be avoided. Humor and fun are fine, but not if some person, group, or department is presented in an unfavorable light. No matter how well intentioned the slight sarcasm may be in the editor's mind, there will always be some people who will resent such presentation.

There are ample opportunities for injecting humor into the publication, via jokes, cartoons, and features, without having to resort to ridicule. The fact that some readers, perhaps the majority, might find such material very funny doesn't justify the outright resentment that might develop in a few employees.

All stories, especially important ones on company policy or plans for the future, should be checked and double checked for accuracy. Every statement of fact should be confirmed by the proper authority. Many internal house organs have died before picking up very much steam precisely because of irresponsibility in this regard. Needless to say, this is not only a problem of management annoyance over being misrepresented—readers become confused and then disgusted (and finally non-readers) after repeated misinformation. Printing corrections is the honorable way to make up for errors published in previous issues, but the appearance of too many corrections is a definite sign that something is radically wrong—and that something had better be done soon.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Avoid libel. This involves becoming familiar with certain facets of the law, but the real preventive measures are accurate reporting and writing, checking and rechecking facts, and thorough proofreading. Libel suits involving house organs are relatively rare, but the danger is always there. Common sense avoidance of dubious material is the best way to steer clear of trouble.

Internal house organs are among the most effective of auxiliary tools of communications. Wisely planned and energetically edited, they provide a wonderful means of cementing company loyalty, improving employee morale, and centering real interest on all facets of plant functioning.

In some plants, house organs are still non-existent—either because management isn't "sold" on their value or feels that the cost of launching and maintaining a publication would be prohibitive. The fact of the matter is that employee publications have proved their worth time and time again in a great variety of industrial organizations. The cost factor, when compared with potential results, is negligible. Then too, it should be remembered that even a small, mimeographed first effort is better than no house organ at all.

In some other plants, employee publications have been around for so long that they are coming to be taken for granted. When the publication is looked upon as a completely self-sustaining thing, the constant search for self improvement by editors and writers and management men tends to slow down, and even stop altogether.

These attitudes eventually lead to lowering of editorial and writing standards and, inevitably, a dwindling of reader interest. It is not easy to know when such a process begins to set in, employees may still pick up the publication out of sheer habit and give it a cursory glance before throwing it out.

The only way consistently to avoid the pitfalls of overconfidence in yourself and in the publication is to conceive the operation as a continuing task that demands constant search for improvement. The **good** house organ **can** do a whale of a personnel relations job, but the house organ that's merely "cranked out" will rarely be a truly good one.

Willingness to do more than "enough," attention to detail, and genuine enthusiasm—these are the ingredients for an outstanding employee publication.

Other auxiliary communications devices include:

Plant Tours and Open House Programs
Recreation Programs
Orientation and Training Programs
Bulletin Boards and Suggestion Boxes
Annual Report of Company
Supervisor Policy Manuals

Plant tours and open house programs are being more and more utilized by plants throughout the country. The emphasis here is, of course, on community relations, a frequently neglected aspect of industrial communications.

"Get out and mingle with others more, Mike. Promotion today depends on getting along well with other people."

The really satisfied worker is one whose family and friends understand and respect the job he holds in the plant. The employee publication in the worker's home does a good community relations job along this line, but plant tours and open house programs can do this job a lot more directly and effectively.

In most cases, special committees are set up to handle the planning and assume the responsibility. These committees meet regularly with an eye on always improving the methods employed to "show the plant to the public." The cost of these programs is not nearly as high as it might seem at first glance. Experience has shown that well planned programs can be installed at very low cost—and with fine public relations results.

Recreation programs can be solid backbones for the communications system of any plant. No management in industry today underestimates the employee relations job that athletic and recreation programs can do. Insofar as these programs boost worker morale and enthusiasm, they are making employees salesmen of the company's virtues. For best results, however, the programs have to be planned wisely and promoted extensively. House organs, orientation and training programs, and bulletin boards can all be used to good advantage here.

For a long time it was feared by many that television would wreck plant

Drill Presses Cut Downtime

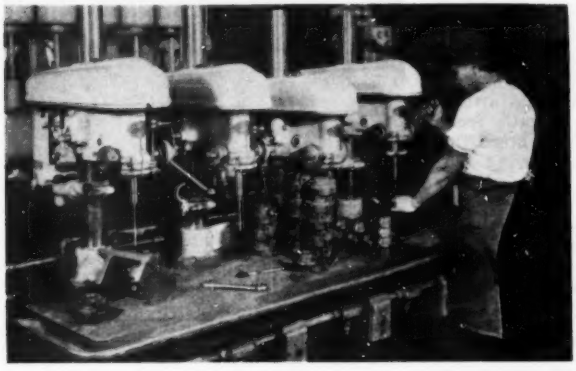
TUTHILL Pump Company of Chicago, Ill., manufacturer of industrial pumps, has cut machining and maintenance costs and reduced change-over downtime to a minimum by utilizing 26 standard table-mounted drill presses for a wide variety of drilling and related operations.

The Delta drill presses—two mounted individually, the rest, two to five to a table—are used for drilling, tapping, reaming, counterboring, countersinking, spotfacing and similar operations on pump housings and components.

The pumps are used in more than 150 industrial applications such as diesel engines, marine equipment, dental chairs, refrigeration compressors and oil-burning equipment.

The drill presses are table-mounted because many of the components being machined require several operations. Having the presses mounted side by side on the same table simplifies transfer of the work piece from one operation to the next.

To further simplify materials-handling, many of the work tables are lined up end-



Four drill presses are used to drill angle holes in a pump housing. Holes drilled are ¼", 5/16", ½" and 7/16". The firm operates 26 Delta drill presses in the machining of pump parts.

recreation programs; however, careful planning has avoided the scheduling of major events on the nights the most popular TV shows appear, and recreation programs are still going strong. Employees apparently still enjoy their bowling nights and softball afternoons with their fellow workers.

Some of the activities sponsored by plants throughout the country include: bowling leagues, softball teams, basketball teams, boxing clubs, chess and checker clubs, riding clubs, rod clubs, glee clubs, girls' clubs, and horseshoe tossing competitions. Obviously, not all companies are able to sponsor such a wide variety of events. It is to the plant's advantage, however, to sponsor as great a variety of activities as it reasonably can.

Orientation and training programs are widely being accepted as effective means of communicating to the worker about a great many things besides where the washrooms are located and how to operate a particular machine. A fine job of "selling" the company to the new worker can be done with a good orientation program. The virtues of a company can also be communicated to the worker's family—a letter can be sent to his home welcoming him to the working force; information booklets with extensive explanations of such things as fringe benefits, overtime policies, wage payment plans, and product information often are taken home; full utilization of such audio visual methods as films, slides, charts and records can effectively promote general understanding of the company and an enthusiasm that often gets the worker talking to the other members of his family about the company.

Bulletin boards, used with imagina-

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to-end in a straight row resembling an assembly line.

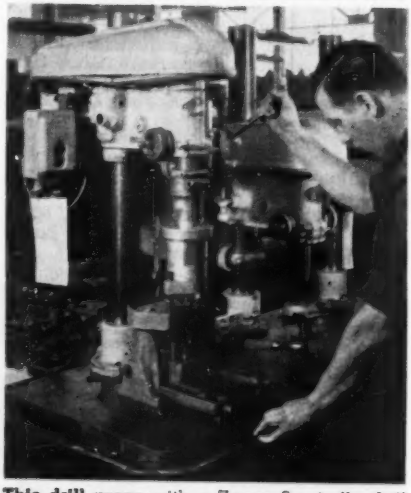
Although setup changes are often required twice daily because of the wide variety of pieces machined, it takes only a matter of moments to retool the drill presses.

Additional time savings have been achieved recently by installing a Delta automatic feed device on one of the drill presses. This press is equipped with a Zagar drill head with three No. 32 drills and is used to drill twelve holes in a pump housing. The output on the press is 83 pieces an hour and the housing is loaded and unloaded on two different fixtures.

The housing is locked in a jig and positioned under the drills, and the operator manually lowers the spindle arm a few inches to engage the automatic feed, which then moves the drills through the operation and retracts them. During this cycle, the operator is free to handle an adjacent machine.

Although the drill presses used by Tuthill have been in operation two shifts a day for seven to ten years, E. M. Voelker, plant superintendent, reports practically no maintenance costs and continued accuracy.

The End



This drill press with a Zagar 3-spindle drill head is equipped with a Delta automatic feed device. With the piece properly positioned, the operator lowers the spindle arm a few inches to engage the feed mechanism, which then moves the drills through the operation and retracts them.

tion, can do a lot toward creating good will in the plant. It has been found that more interest is maintained if the material used is primarily local. The boards should be attention-getting, so pictures and lively colors should be in evidence always. The material on the boards should be changed regularly and often if readership interest is to be maintained. When it is feasible to do so, it is wise to welcome employee participation. Such items as unusual snapshots of workers on vacations should be used whenever possible, and the results of plant league games and future schedules are of interest to a majority of workers.

Suggestion boxes, despite the sometimes inane responses, are valuable morale builders. They give the worker complete freedom to let off steam—to give vent to pent-up feelings by "telling the boss" how to do the job. The benefits gained by a suggestion system, aside from the valuable ideas sometimes received, are largely intangible contributions to over-all worker morale —but they are nevertheless real and important.

The company annual report is often not thought of as a means of "humanizing the business," but this is precisely one of the important things it can do. After all, what is it that gives rise to the notion that a modern industry is a mysterious, impersonal "monster" which goes its own way and somehow exists for its own sake alone? Obviously, this is a silly view—somewhat on the level of an infant's view of a racing locomotive. As the child sheds his silly notions about the train when he learns that an engineer controls its movement and that it has a planned destination, so the average man sheds his misconceptions about the modern company when he comes to know its objectives, its organizational structure and the vital role human beings play in its functioning. The annual report, in giving information about the company, where it is going and how it is getting there, does much to create good will through understanding — to "humanize the business."

Supervisor policy manuals insure unaltered transmission and daily administration of top management's policies and provide an authoritative reference guide that stays on the job. Line and staff roles in each activity are clarified; the foreman's identification with top management is strengthened, and the personnel job is done at the point of employee contact—in the plant proper. The manual defines the extent to which the foreman can act on his own, and indicates situations in which he must seek prior clearance from above.

In the next article, Edward O. Dieterle, Thor Corporation management consultant, will outline with us some new organizational "twists" to the old problem of communications systems in industry.

The End

"I've got to ask permission to go to the ladies lounge hereafter."

Improved Operating Valve Is Safer, Reduces Press Downtime, Equipment Damage

By **M. Bryan Baker**
Associate Editor

OPERATOR INJURIES, equipment damage, downtime are all of the greatest concern to any firm using presses. By "sensing" valve or line malfunctions, this improved new air control valve that shuts off—it is so sensitive it detects failure at the rate of 600 cycles per minute—at the slightest sign of danger, has been announced by Ross Operating Valve Co., 108 E. Golden Gate Ave., Detroit 3, Mich.

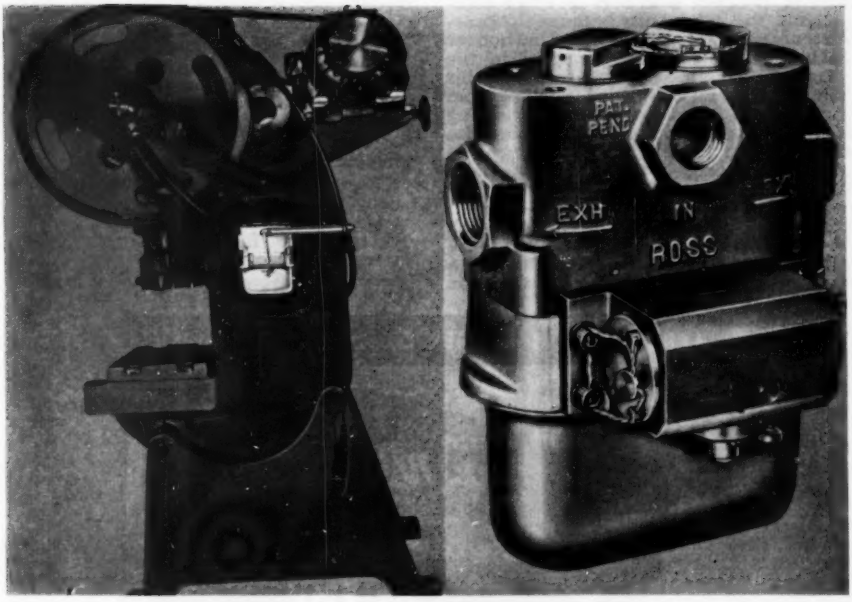
According to statistics, a majority of accidents are caused through failure at the input supply of air at the main valve. When the "Lifeguard" valve "feels" something out of order along the line, it cuts itself off immediately and the press stops in a safe position.

For controlling brakes and clutches or other equipment on presses that operate on air, the new valve is said to be a distinct improvement on previous methods including the dual valve, the latter allowing operation if half the valve became inoperative.

The Lifeguard is basically a three-way poppet type valve consisting of two complete valves with a common housing. It has two interconnected exhaust ports, a single cylinder or out port and one inlet port. Two pilot sections have individual exhaust ports and solenoids with the same air supply. Attached to the pilot section is the main part of the safety feature, the cutoff unit, that stops functioning of the unit when there is any malfunctioning of any part of the valve.

The valve's operation is simple. The air is exhausted from the top of the piston poppets in the de-energized position, allowing the inlet port to close and opening the cylinder port to the exhaust ports.

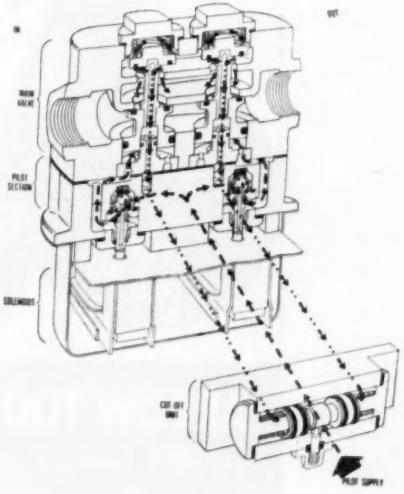
When energized, pilot air is introduced into the pilot section and into the top of



1. Illustrated is the Ross Lifeguard air control valve in a typical installation, and a close-up of the unit. This valve senses malfunctioning, shuts itself off when any component part doesn't operate normally. Danger to operator, machine is reduced.

the main valve piston poppets, through the cutoff unit. This closes off the exhaust ports and opens the inlet poppets, allowing the air supply to flow from the inlet to the cylinder port. Because the air pressure on each side of a spring-centered spool in the cutoff unit is the same, the spool remains in balance. However, these pressures are independent of the pilot air supply and also independent of each other.

When anything goes wrong with the



2. Here the valve is energized (valve pressurizing) as the pilot valves supply pressure air (through center of cut-off unit) independently to bottom of piston popets, thus reversing main valve; inlet is open to outlet; exhaust ports are closed; both ends of cut-off unit are independent of each other, independently connected to the main supply openings, and are being pressurized equally.

springs, poppets, solenoids or other components, the valve quits because the pressure on each side of the spool no longer balances, thus moving the spool in the direction of the lesser pressure. When this happens, a spring-loaded locking pin snaps into a recess in the spool, holding it in a locked position and stopping the air supply to the pilot section. Since the air that is already in the head of the main valve is now trapped, the cycle the press has started is finished. When the top of the stroke is reached, the limit switch de-energizes the electric circuit to the valve, allowing the exhausted air from the heads of the main valve to escape through action by the pilot section, stopping the press in its safe position.

Because of the design of the valve, terminal blocks, solenoids, etc., can be replaced without disturbing the wiring. The main valve section can be removed without disturbing the control sections and the cutoff valve section is mounted on the solenoid valve section.

This valve has been tested in the laboratory at 360 times a minute, or 100,000 cycles per day over long periods; actual field operation has also been carried on extensively.

The End.

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Shop HINTS

Expanding Mandrel Turns, Faces Aluminum Shells

By **H. J. Gerber**

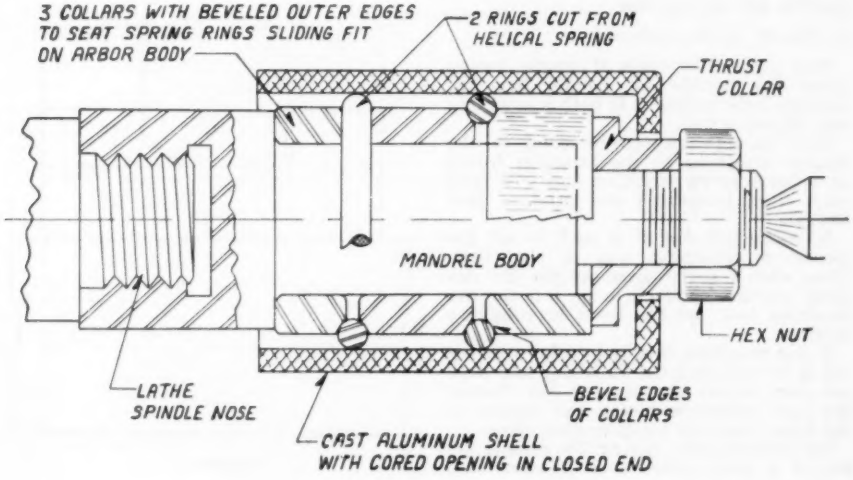
THE ILLUSTRATED MANDREL was very successfully used for turning and facing a quantity of cast aluminum shells which had been rough bored in a previous operation. A large tolerance on the rough bore necessitated some sort of size adjustable mandrel which could be easily loaded and unloaded on the machine.

The shells had a cored hole in the closed end and this made it possible to support this end of the mandrel on the tail center of the lathe.

The size adjustable feature of this design consists of two turns cut from a closely wound helical spring which was obtained slightly under the size limits of the bore in the castings. These spring coils were seated between the "V"s formed by the beveled edges of three loose collars machined to a snug sliding fit on the mandrel body. When the nut on the tail end of the mandrel is tightened, the axial pressure forces the collars together which in turn forces the spring coils apart to grip the i.d. of the work piece.

A blind or closed end shell could be held by a modified form of this same mandrel by providing a drilled hole through the axis of the mandrel and using some sort of draw-in rod through the lathe spindle to apply the closing pressure.

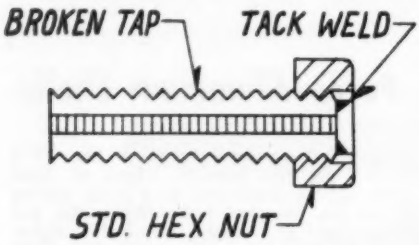
I would recommend that the mandrel body and the sliding collars be carburized, hardened, and ground for greatest accuracy and durability.


3 COLLARS WITH BEVELED OUTER EDGES TO SEAT SPRING RINGS SLIDING FIT ON ARBOR BODY
2 RINGS CUT FROM HELICAL SPRING
THRUST COLLAR
MANDREL BODY
HEX NUT
LATHE SPINDLE NOSE
BEVEL EDGES OF COLLARS
CAST ALUMINUM SHELL WITH CORED OPENING IN CLOSED END

Use for broken taps

By **Roger Isetts**

Instead of throwing them away, one plant found a way to utilize broken taps to very good advantage. It was found that in assembly work, many times the tapped holes would become clogged with foreign matter, or the thread was slightly undersize, in which case the fastening screws



would not enter the holes. Much time and expense was incurred transporting and retapping them in the machine shop.

The method illustrated was cheap and simple to make and works surprisingly well. In addition, it is a good way of saving tools that would otherwise be scrapped.

A standard hex nut is screwed about three quarters of the way onto the broken end of the tap and tack welded in place. A ratchet or speeder wrench is then used to quickly wind the tap into the work.

Double bit boring bar

By **Harold D. Rhodenbaugh**

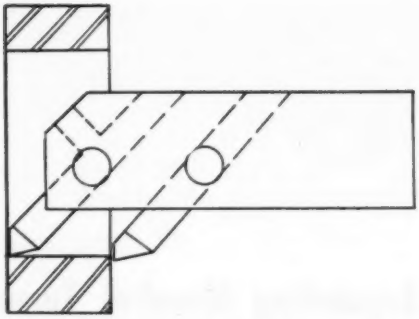
Few production tools of simple design excel the double bit boring bar. On through hole boring it is both a roughing and finishing tool.

This boring bar can be used in the square turret or in the hexagon turret on a hand screw machine and will hold very close tolerances and produce fine finishes.

In using this bar it is well to set the second or finishing tool to size first. Then with a feeler gage set for the desired amount of stock to be left for the finishing tool, set the front or roughing tool.

If the roughing tool is to take a heavy cut it is well that the finishing tool does not start before the rougher has cleared the part, otherwise a step will appear in the bore when the rougher does clear.

On through hole boring the double bit bar is a time saver since it eliminates



the necessity of indexing or it relieves a tool station for the mounting of an additional tool.

Equalizer centers stock when piercing

By **Roger Isetts**

When piercing holes in rough stock it is often necessary to have the holes centrally located in the piece. If the stock varies even a trifle, solid type channel gaging as shown in Fig. 1 cannot be used because clearance is necessary in order to be able to shove the stock easily through the die.

Illustrated in Fig. 2 is an equalizing

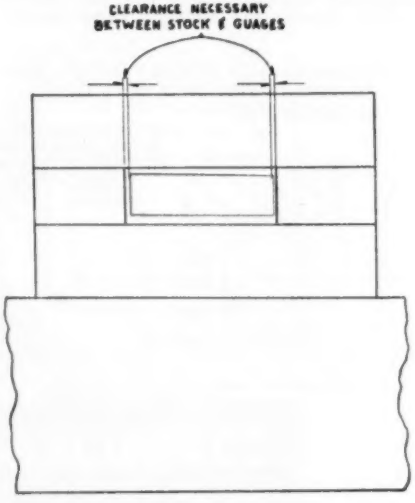


FIGURE 1

arrangement that automatically centers stock even if it varies a considerable amount.

A sliding equalizer block made of hardened tool steel is machined off centrally on 30° angles. This block is contained in its up and down travel by means of a tongue. A stiff die spring maintains

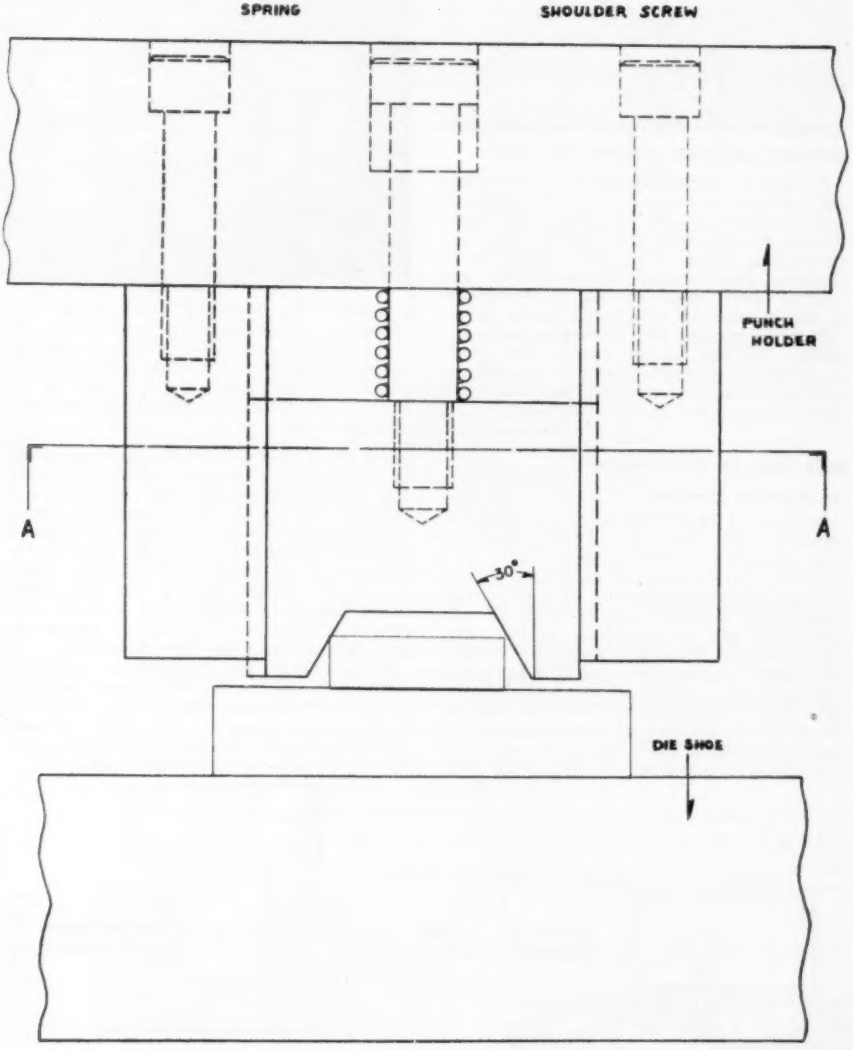
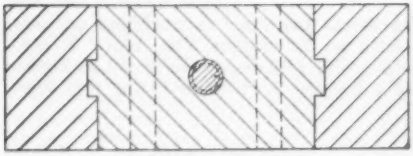


FIGURE 2



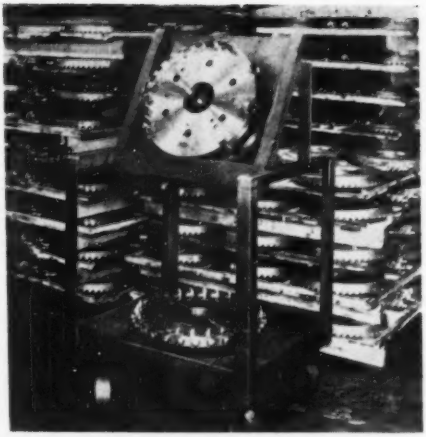
Section A-A

pressure on the stock until the piercing punches enter the stock.

Castered table designed to transport, protect, position vulnerable cutter

A heavy, hard-to-handle, razor-sharp gear cutter presented a severe problem with respect to safe handling and positioning for the Axle Div., Eaton Mfg. Co., Cleveland, Ohio. The tool, used on a Gleason gear cutter, is employed for cutting gears used in the manufacture of the company's two-speed truck axles.

The 18" cutter, which weighs approximately 200 lbs., is too heavy, the teeth too sharp to safely handle manually. In addition, the cutter must be presented for loading on the machine in a prescribed position. The castered table is so designed that the cutter is removed at the right height and in the correct position to be engaged by a swinging arm on the machine which positions the tool in the limited quarters in which it is mounted.



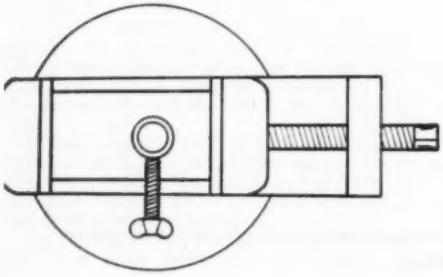
Indexing in the shaper

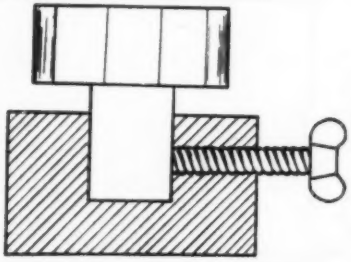
By **Federico Strasser**

Recently I had to do a small-run rush indexing job and no milling machine was available at the moment, so I decided to try the shaping machine.

I took an adequate piece of machinery-steel-block, planed squarely on all six sides and put it centrally in the vise of the shaper. Then I located the revolving center of the vise. For this purpose, I put a heavy scriber in the toolpost and after having blocked the toolpost-hinges (in order to impede its swinging movement) I moved both the ram and the side-translation wheel of the table by hand until I got the scriber approximately in the center of the vise. Then, I lowered the toolholder until the scriber-point touched the steel block surface (which had been previously treated with copper-sulfate solution). I turned the vise slowly describing a small circle which gave the vise center. Taking out the steel block, I bored a hole at the correct location and diameter and also a transversally tapped hole for the set-screw.

In operation, the workpieces, provided with a round shaft and a head with 10 sides, are put into the fixture and the angle graduations of the vise utilized for indexing; in this particular case each 36° corresponded to one division.





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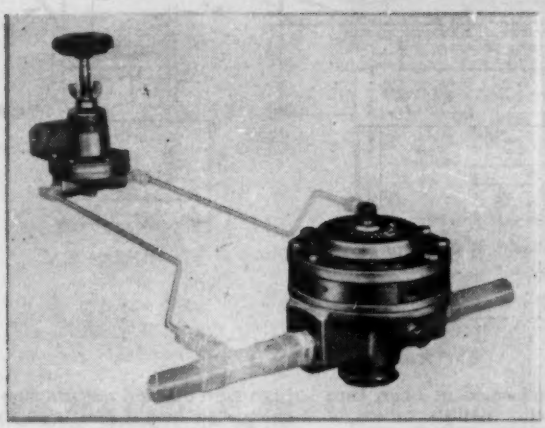

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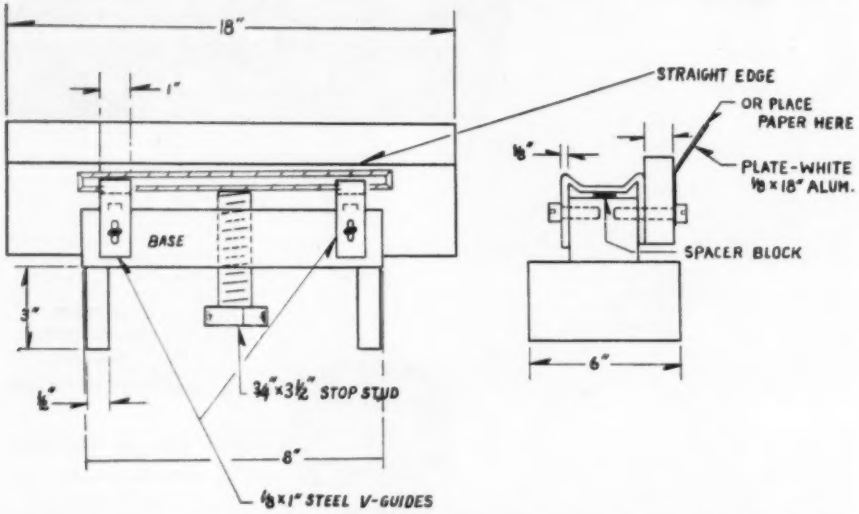
Straightening fixture

By **Harold D. Rhodenbaugh**

The straightening of steel tubing and steel bars before and after heat-treating is a slow and expensive operation, especially when it is done in V-blocks with a mallet or lead hammer. Here is how of .003 t.i.r.

The operator places a white sheet of paper behind the fixture on paperholder. He then rolls the tube on the straight edge of fixture, sighting through between the tube and straight edge, finding the high side. Next he lays the tube in V's,



this operation is performed at Lear, Inc., Grand Rapids, Mich., manufacturers of precision aircraft instruments.

The straightening fixture shown here is clamped into position on a Denison Multipress. The press is set at three-ton pressure for straightening a ⅝" dia. torque tube of 4130 steel to hold a straightness

high side up, and adjusts stop stud to the calculated height and trips the press.

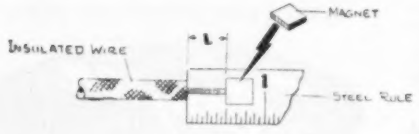
After a few hours, the operator becomes very skillful in calculating where to set the stop stud to obtain the desired results.

Actual time study of the old and new way showed a fifty percent increase in production.

Checking the length of stripped wire

By **Henry A. Roy, Sr.**

When a wire is stripped of its insulation and the stripped end or 'L' of that wire has to be measured, the following method will be very helpful and efficient: (1.) Place a magnet on the steel rule at the desired length; (2.) place the wire on



the scale as shown in figure 1; (3.) the length of the bare wire will be easily read.

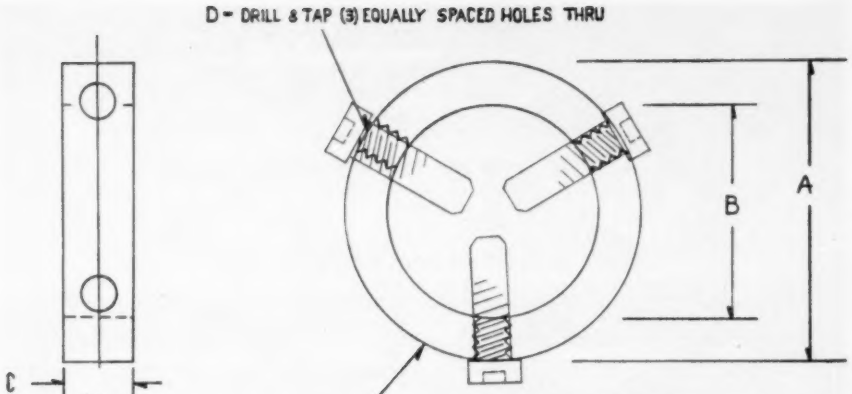
This idea comes in very handy when a large number of pieces that have to be checked are involved.

Spiders to facilitate chuck boring

By **Harold D. Rhodenbaugh**

One of the most bothersome machine shop tasks is that of trying to accurately bore chuck jaws with nothing better than just any piece of bar stock upon which to clamp.

To clamp the back lash out of chuck



SPIDER - 8620 STEEL

A	B	C	D	
1½"	½	⅝	¼-28	
1"	⅜	½	10-32	
½"	⅛	½	10-32	

jaws is a must in boring chuck jaws if anything like accuracy is to be maintained.

A set of three (3) spiders, each set containing one or more sets of ¼" dia. Allen screws of 1" increment lengths, will accurately bore any three jawed universal chuck up to and including a 14" chuck.

These spiders are quickly and easily adjusted as well as being inexpensive to make.

Note: On old or worn chucks it is always well to clamp the work from the same chuck key location used to clamp in the spider.

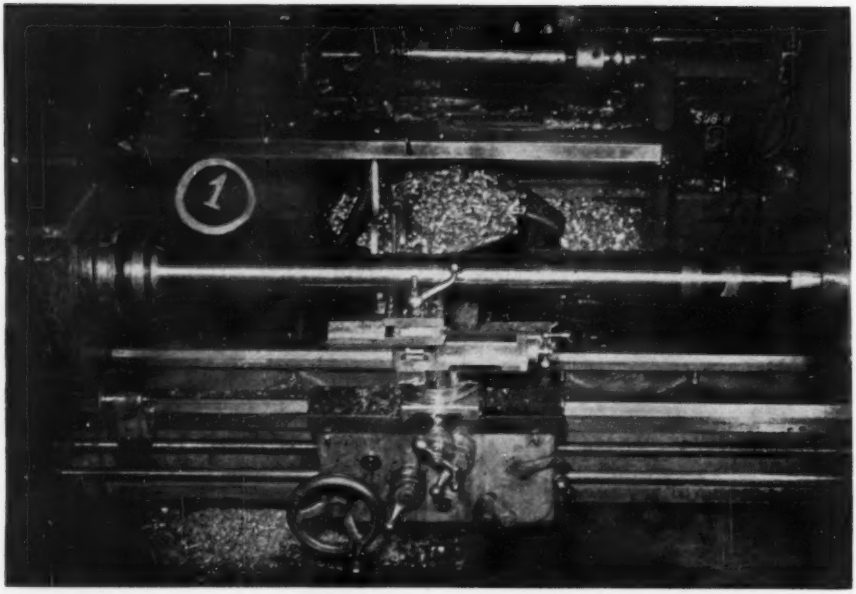
Eliminate chatter on turning operation

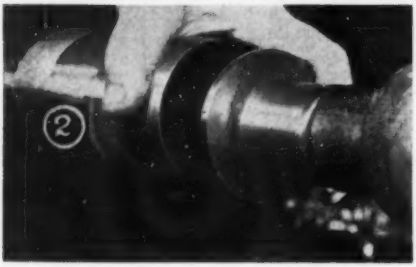
By **R. H. Bennett**

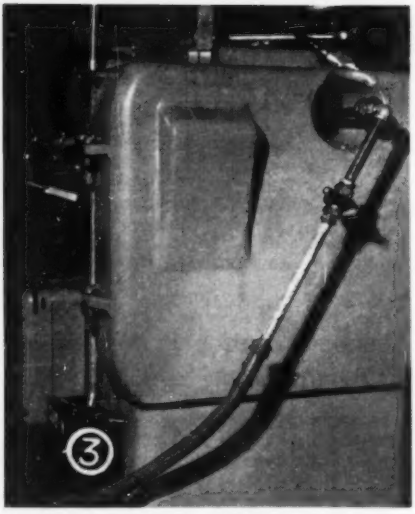
In most instances the harmonious vibrations that cause chatter marks can be traced to worn machine ways and spindles, loose or poorly designed tooling, the wrong cutting speeds and feeds and, more often than realized, machines too small for the job. However there comes a time in every machinist's life when even after making all the necessary adjustments and corrections to the machine and tooling, he finds that the finish of the piece still resembles an expansion watch bracelet. From there on in he's on his own and only an ingenious imagination can save the day.

A specific example occurred in the shop of the Overland Machine Products Co., a Los Angeles manufacturer doing work for the aircraft companies.

From its appearance, turning and chasing the threads on the shaft shown in Fig. 1 seems to be quite the ordinary,

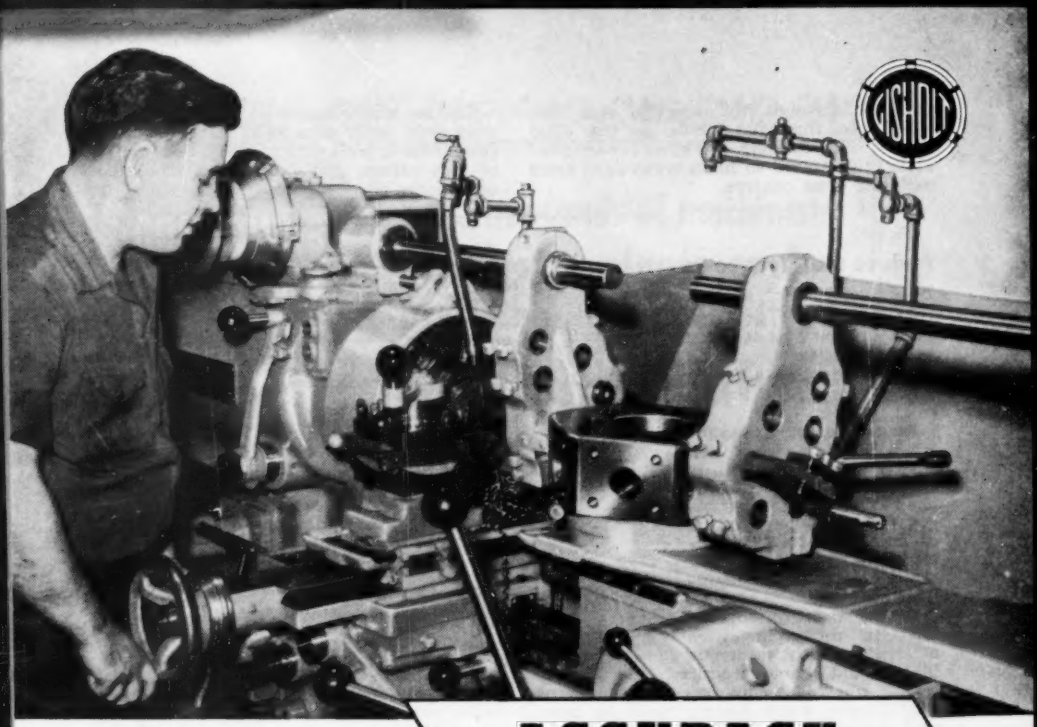






run-of-the-mill turning job. However, upon examining Fig. 2 which shows that the shaft is machined from a 4 foot long section of 3¼" dia. SAE-4130 tubing, an entirely different light is focused on the job revealing a real chatter-provoking situation. The work is set up in the conventional fashion—mounted between cone centers (live center in the tail stock) and cut with t.c.t. tool bits mounted in a square, cross-slide turret. A pointer attached to the carriage indicates the length of cut on a scale fixed to the lathe bed. The scale is marked for the different lengths of cuts. The longest turned section is 34" long with a finished wall thickness of .0625".

The unusual appearance of the setup is shown in Fig. 3. The rear of the spindle is fitted with a liquid tight swivel joint and is connected by a hose to a pump, and machining is done with the shaft full of water under 10 psi. The water is



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Above: *Bed and Headstock are cast integrally to form an extremely heavy unit and to provide the rigid foundation for all types of work.*

Below: *Block type ways are straddle keyed to the bed and ground in perfect alignment with the spindle. All working surfaces are hardened to 64-66 Rockwell "C".*

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Hardened steel ways are augmented by hardened steel strips secured to the ram saddle, as well as hardened steel gibs and clamps, making an assembly that is virtually wear-proof. Its accuracy is further preserved by force lubrication.

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pumped through the spindle into the workpiece through a hole in the cone center. The tubular workpiece was previously prepared to form watertight seals with the cone centers.

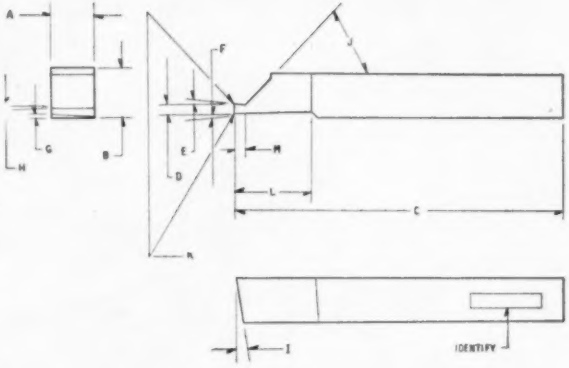
Chatter was eliminated so successfully that even with cuts .0625" deep, surface roughness is well within the 40 to 60 range of rms values, and production schedules of 4 pieces per hour are maintained.

Reduce undercut costs

By Edward McIntyre

Undercut and grooving tools can be standardized with minimum effort and at considerable savings in design, time and tooling cost.

This charted or tabulated sketch was used to capture the various widths of undercuts at shop-level in an instrument plant where widths of undercuts (see Dimension "D") had not been standardized by the engineering staff.



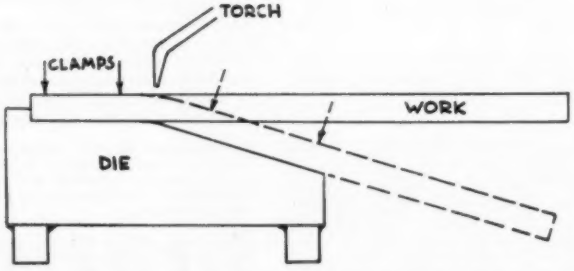
It was soon discovered that in many instances a single width undercut tool would have produced the desired result, whereas as many as five different width tools were being used to meet part print requirements. It was further learned that each individual engineer was calculating the width of his undercuts with little regard for tooling to produce the undercuts; various widths, which appeared on parts prints—.020/.025 - .025/.030 - .028/.031 - .035/.040 - .045/.048 etc. were all reliefs for grinding operations.

What the engineers failed to comprehend was that a minimum quantity of ten tools had to be made up and be maintained for every width of undercut called out. It can further be pointed out that a quantity of these tools would be made up, used once perhaps, and never again be called for, a "frozen inventory" condition.

Bending heavy bars by heat and gravity

By Ernest Gruen

For job lots or small production runs, the bending of heavier bars can be done fairly accurately by heat and gravity without the need for expensive tooling, especially when the bend is near the end of the bar. The drawing shown here represents the bending of a 1" x 4" x 70" mild steel, hot rolled bar, at a point 15" away from one end.



The tooling consists of a shaped die block, made of 4" thick mild steel. The work is clamped as shown in solid lines against the end stop and an oxy-acetylene heating torch is used on the bend line. After sufficient heating, gravity will drop the long end of the bar as shown in broken lines. Two more clamps (shown as

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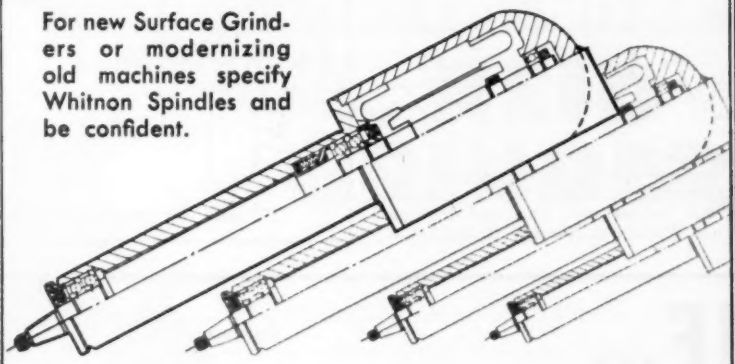

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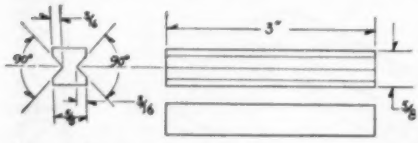
broken arrows) serve to assure good contact between work and die. Side stops (not shown) can be provided for greater accuracy as an added feature.

V-block boring bar holder

By **Harold D. Rhodenbaugh**

Precision boring on a hand screw machine is usually done by mounting the boring tool in the square turret rather than from the hexagon turret. By precision boring I refer to tolerances within plus/minus .0015.

In boring small diameter holes—holes under one-half inch diameter—it is often difficult to adapt a round boring



bar to the square turret.

This shows a simple and economical answer to this problem. This V-block boring bar holder was designed for use on a No. 3 Warner & Swasey turret lathe.

They are inexpensive and quick to make. A quantity of these boring bar holders in every screw machine department will greatly reduce cost in setup time.

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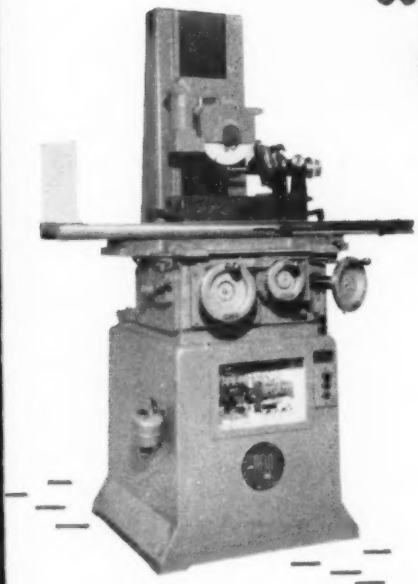

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Time and Cost Saving Ideas

By **Walter Strike,** Tool Engineer
Milwaukee, Wis.

IN SPITE of the many accessories and labor saving devices on the market the tool engineer must still invent many novel ideas in the course of his daily work. In this short article are several ideas we have developed recently; they might be a thought starter for other tool engineers.

Grinding Fixture Features Speed and Accuracy

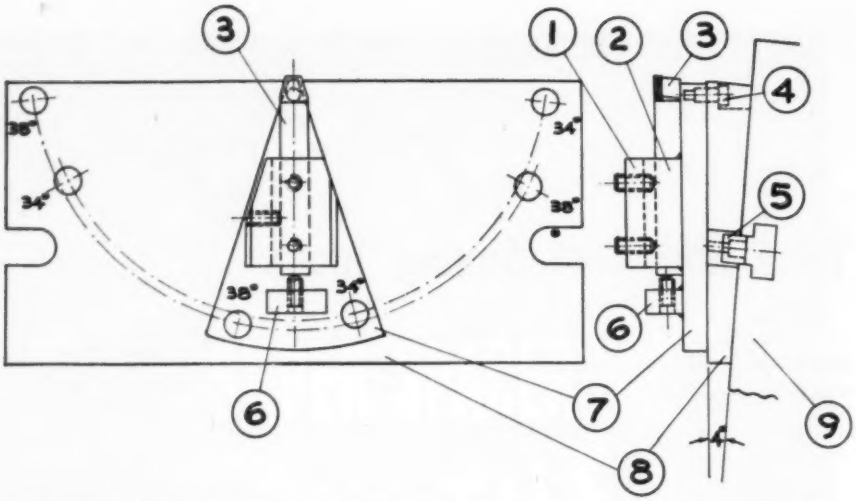
The illustration shown here pictures an index grinding fixture for carbide sheave tools, tools which cut the vee-grooves into vee-belt pulleys. The fixture was designed for extreme accuracy of the tools' cutting angle and for quick action. The idea on which this design is based can well be used for the sharpening of other types of special cutting tools, carbide or others.

Two sizes of cutting angles are accommodated in this fixture: 34 degrees and 38 degrees included angle. The tool (3) is placed beneath a clamp bar (1) which is welded on top of two uprights (2). The tool is forced against the right upright by a screw within the left upright. End adjustment is made by a screw that is anchored in a third upright (6). All three uprights are welded to slide (7) which is hinged to the base (8) by shoulder bolt (4).

Two index holes, one for 34 degrees and the other for 38 degrees, are in the slide (7). These holes are on circles of different radii to prevent errors by the operator. The base plate (8) has three sets of index holes, three holes for each angle. They are calculated to permit the grinding of all three cutting edges of the tool without readjustment of the grinding wheel or grinder table (9).

An index pin (not shown) determines the correct position of the slide in relation to the base and a small shoe-type clamp (not shown) can serve to hold the slide to the base in each position.

The end relief angle and the side relief angles of both types of tools, in this case, was 4 degrees and therefore the bottom of the base (8) was machined at 4 degrees with the top of the base.



An index grinding fixture for carbide sheave tools which cut the vee-grooves into vee-belt pulleys.

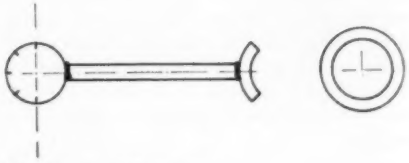
Radius Gage Made by Turret Lathe

When our shop needed a considerable number of sets of radius gages, we decided to look for a simple method of making them and at the same time, making them more accurately.

We took barstock, finish turned a length of it in the turret lathe and sliced off disks with the cut-off tool. These disks were approximately 1/16" to 3/32" thick and they were to serve as the male gage ends. Chisel marks at 45 degrees and 90 degrees spacing served as indicators of tangent points.

To make the female end, we turned and bored the stock and sliced off rings. A short end of rod was then brazed to the disk on one end and to the ring on the other. Then the unwanted portion of the ring was cut off. This removed portion could be 270 degrees as shown, or 180 degrees, or any other required angle.

The described method is simple, fast and inexpensive and also more accurate than the making of sheet metal radius gages by hand .



Making a radius gage.

Template Storage Designed for Quick Handling

To store steel, wood or composition templates on edge and, at the same time, permit speedy storage and removal, try this self-tightening feature, the principle of which is shown in the accompanying illustration.

Two round bosses are drilled slightly off-center to give the effect of an eccentric disk. These bosses are bolted with a shoulder screw to the wall,

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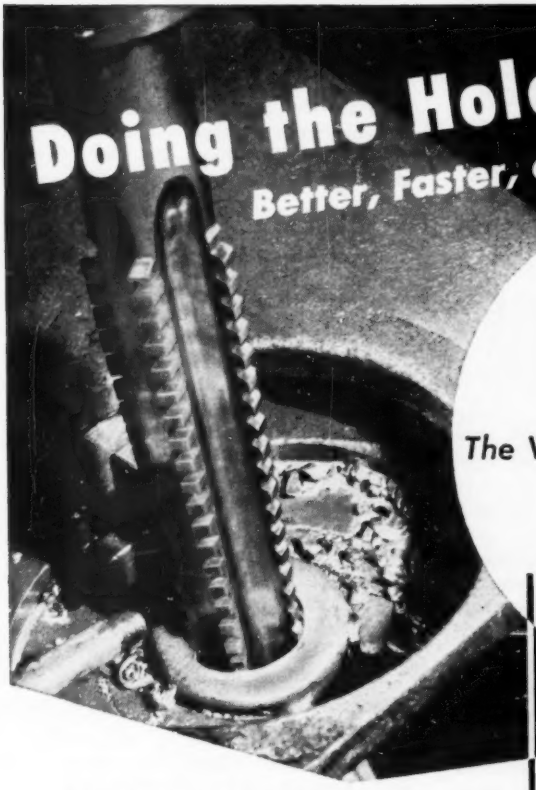

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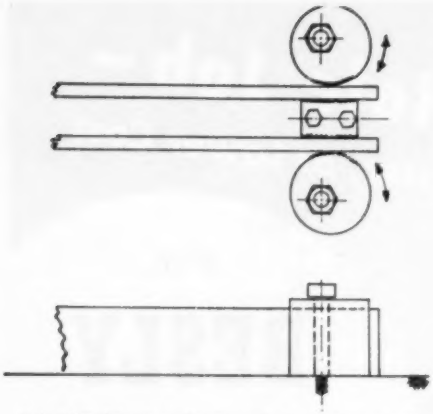


A self-tightening feature for storing steel, wood or composition templates on edge.

A key (5) holds the fixture to the table of the tool grinder.

The fixture shown has decreased grinding time by 65%, setup time by 90% and rejections due to inaccurate angles have been eliminated entirely.

Utility Sine Plate for Milling, Boring or Jig-Boring

Occasionally, the need for milling, drilling or boring at odd angles arises when machining jigs, fixtures, short lots or experimental work. In many cases, extreme accuracy is not required and the machinist helps himself by using an odd assortment of blocks, shims, studs, bolts and clamps. Unsafe and time-consuming, such methods can be discontinued if you build yourself an oversize sine plate as shown here.

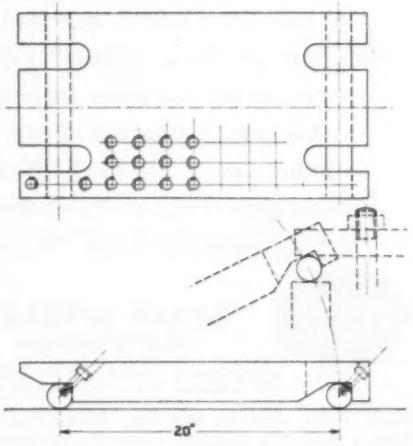
A steel or iron plate, well stress-relieved, about 14" x 25" x 1¾" is machined and ground on top and bottom as shown. It is important to keep the four bottom vee-surfaces, against which the two round bars are bolted, straight and parallel in all directions. The two round bars, about 1½" in diameter, hardened and ground, are bolted against these vee-surfaces in such a manner that the centerdistance between them is exactly 20".

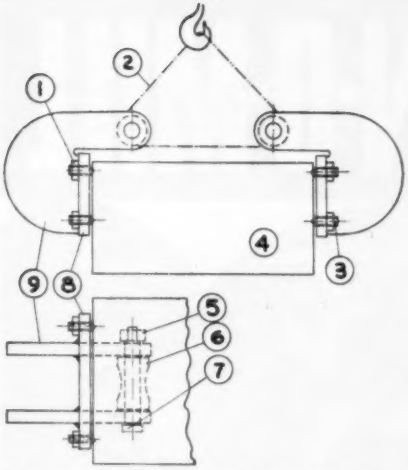
To tip the plate by a desired angle, two blocks are machined to a length which is determined by one of the following two methods:

1. If a sine chart is available from another sine bar or sine plate, multiply the dimensions given by four (if the chart is for a 5" sine bar), or by two (if the chart is for a 10" sine bar).
2. If such a chart is not available, use the "Trig" tables that can be found in any handbook or math book. Be sure to use the tables entitled "Natural Trigonometric Functions" as the tables entitled "Logarithms of Natural Trigonometric Functions" are not suitable. Find the desired angle in the left hand column by degrees and minutes and read the corresponding figure in the "Sine" column. Multiply this figure by 20 and the result is the block height.

Example: The desired angle is ex-

An oversize sine plate.





Two small welded devices which hold safely, and lift, many times their own weight.

actly 30 degrees. Find the block height.

From the trig tables: Sine of 30 degrees and 0 minutes equals .50000
Multiply 20 by .50000
Answer: 10″

Example: The desired angle is 13 degrees and 10 minutes.

From the trig tables: Sine of 13 degrees and 10 minutes equals .22778
Multiply 20 by .22778
Answer: 4.555″

Sine bars or sine plates are normally made for center distances of 5 or 10″. This, being a larger plate, was designed for 20″ in order to take advantage of available sine charts. However, any centerdistance can be used, but if an odd distance is used, it will usually be necessary to use Method 2 instead of Method 1 for the determination of the block height. If, for instance, 21″ is used for the centerdistance, just multiply the sine from the tables by 21 instead of by 20 as outlined above.

The blocks are placed beneath the right round bar, in line with the clamping slots, and two clamps are adjusted to tighten on top of the bar, (see phantom view).

In order to be able to fasten a variety of work to the sine plate, tapped holes are provided at rather close centerdistances on top of the plate.
bench or storage rack. Between the bosses, a flat bar is bolted to the same surface. Both disks and both sides of the flat bar are provided with serrations or knurls.

The templates are inserted from the bottom in an upward motion. When the motion is complete, and gravity takes over, the serrations bite into the template material and keep the template from falling downward. Removal of the template is done by an angular motion, upward and outward.

This storage method saves space, eliminates the use of hooks, holes, etc., and can also be used for the storage of tools, materials and other items.

Lifting Devices for Boxes and Crates

The two small welded devices shown here are well able to hold safely, and lift, many times their own weight. They are designed in such a way that four pointed setscrews (3), locked with locknuts (1) and threaded through plates (8), bite into the lumber as the hoist hook moves upward.

Two gussets (9), welded to the plates (8), are drilled and fitted with a roller (6) between them. Pin (7) and nut (5) serve to hold the roller. An endless chain (2), when pulled tight, forces the pointed screws against the wood of the load (4).

For clearness' sake, the lifting devices shown on the accompanying illustration are out of proportion in regard to the chain and box sizes. A device of this design will lift a box or crate of many times the size shown.

For good and safe lifting, the chain sides should approach a 45-degree angle with the horizontal plane. **The End.**

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MODERN TOOLS in ACTION

Simonds Abrasive Eliminates Exhaust Fumes: Equips Fork Trucks With Catalytic Purifier

WHEN SIMONDS ABRASIVE CO., Philadelphia, Pa., modernized the storage facilities in their abrasive grain crushing department, the use of gasoline-powered fork lift trucks was favored. There was only one reason the trucks might be ruled out—the problem of carbon monoxide accumulation in the indoor working area.

The answer to the problem was found in OCM catalytic exhausts, manufactured by Oxy-Catalyst, Inc., Wayne, Pa. Used to replace regular mufflers, these units oxidize more than 95% of the carbon monoxide and hydrocarbons in the truck exhaust, turning them into harmless carbon dioxide and water vapor.

Before the modernization program, kegs of abrasives in the Simonds plant had been carried on platforms from the crushing department to the storage room, using electric and hand trucks. The kegs were stored by rolling off the platforms and piling in rows eight kegs long and one keg high. This not only wasted valuable space in the storage area but, since the heavy kegs were frequently rehandled as many as five times, time and labor were also wasted.

To speed up handling and to utilize available air space in the storage room, Simonds palletized the loads (four kegs to a pallet) and stacked the pallets three high. New trucks were required for the pallets because the older platform-type electric trucks could not be equipped with forks and, furthermore, had outlived their usefulness. Two Mobilift Model E.E. gasoline-powered fork trucks, equipped with OCM catalytic exhausts, were purchased

These two Mobilift gasoline-powered fork lift trucks are operated for hours at a time in the crushed grain storage room at Simonds Abrasive Co., yet produce no ill effects on the workmen. Each truck is equipped with an OCM catalytic exhaust which purifies the engine exhaust by oxidizing 95% of the carbon monoxide and odorous hydrocarbons to produce harmless effluents.

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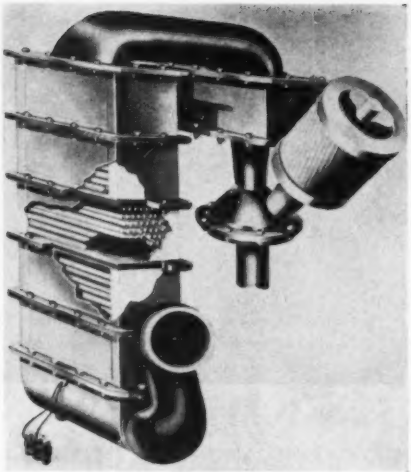


Cutaway view of a typical OCM catalytic exhaust, similar to the ones used on the fork lift trucks at Simonds Abrasive Co. The porcelain rods inside the unit are coated with a catalytic agent — catalytic alumina and platinum alloy—which oxidizes carbon monoxide and other noxious gases to harmless carbon dioxide and water vapor. As the engine exhaust enters the unit it draws in air (to support combustion) through the circular air filter shown at the right. OCM catalytic exhausts are manufactured by Oxy-Catalyst, Inc., Dept. B, Wayne, Pa.

to handle the palletized loads of abrasive grain.

By changing to palletized loads with fork lift trucks, the company was able to save over 50% in time and labor and acquired better than two-thirds more storage capacity in the same floor space. One truck operates eight hours per day in the 11-foot high storage room; the other for sixteen hours. Despite continual use of the trucks, there have been no complaints from exhaust fumes, even in the winter months when windows are closed.

The basic unit of OCM catalytic exhaust systems is a cartridge of evenly spaced porcelain rods coated with a catalytic agent—catalytic alumina and platinum alloy. Depending upon the size of the engine, two, three, or more of these units are placed in series in a metal container. As the exhaust gases pass over the porcelain rods, the catalyst oxidizes the carbon monoxide and hydrocarbons to produce harmless carbon dioxide and water vapors. On leaving the unit, the exhaust contains only a slight trace of the original contaminants.

OCM catalytic exhausts can be used on any engine—mobile or stationary—as long as non-leaded fuels are used, and can be easily adapted to LPG engines. They come as completely assembled units in standard sizes for most makes or sizes of fork lift trucks.

On-the-job savings with flexible shaft machines

Flexible shaft machines have many uses which are familiar to most production men. Stow Mfg. Co., Dept. B, 443 State St., Binghamton, N.Y., has found, however, that its machines are often put on unusual jobs with interesting results. A little ingenuity, plus a flexible shaft machine, goes a long way in solving unusual problems in grinding, drilling, buffing, brushing, or similar separations.

Frequent grinding of the forging dies at Buckingham Mfg. Co., Binghamton, N. Y., was a time consuming and expensive job. One day someone had an idea that the dies could be ground without removing them from the press. A Stow N40 machine was used for the job. According to the company, a 4" dia. 36 grit grinding wheel is used for the first operation, while a 46 grit 4" dia. sanding drum is used at 6900 rpm for the finish operation.

The Governair Corp., Oklahoma City, Okla., found it a problem to grind the welds on large frames with the heavy portable disc sander they were using. It was especially difficult to get into tight spots. By using a multi-speed machine with a standard handpiece and Macklins grinding wheel, cost of this operation was considerably reduced, and operator fatigue was reduced to a minimum.

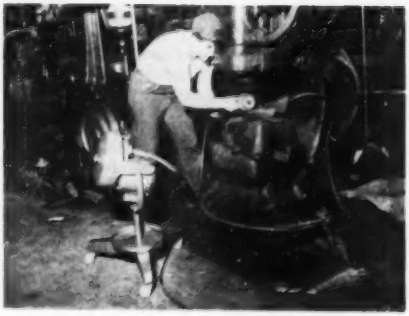
The Hunt Co., Binghamton, N. Y., had the problem of drilling thousands of holes in one of the products it manufactures. Formerly these holes were individually

drilled using a template. Then the company hit upon the idea of using five drills, held in place by a frame, and turning the drills by means of Stow flexible shafts at 1750 rpm. This method speeds production and is five times as efficient as the former method.

The Bowlware Mfg. Co., of Oklahoma City, found that sanding the corners of their metal covered fire doors was a time consuming and expensive job. Its portable size was handy for the size of the doors and its low power of 1725 rpm was necessary because of the thin metal on which they work. The flexible shaft machine now does the job faster, is less fatiguing to their workers, and has a low maintenance cost.

Drilling 12 holes, 7/8" to 1¼" dia., in wooden cable reels was formerly a slow process at J. Hamelin & Sons in Lachine, P. Q., Canada. Each hole was drilled separately. Because of the different size reels (from 2 to 7 feet in diameter) it was thought impossible to build a multiple drilling machine that would handle all sizes. By using flexible tool shafts they were able to make a machine that could switch from one size reel to another merely by clamping the handpieces of the flexible shafts in a different jig. A solid shaft is used for the center 1¼" hole. Ten 3/8" flexible tool shafts are used for the 7/8" holes and two ½" flexible tool shafts for the 1" holes. 1/3 hp motors are used, and the table is raised by a hydraulic lift to feed the work into the drills. By this method, J. Hamelin & Sons are able to produce 12 days work in only one day!

When The Great Southern Stores, Inc. changed from old-fashioned hand methods to a Stow Jiffy Tool machine, the company was able to more than double their output. Formerly they used hand sandpapering to rough up the surface of the tires before applying white plastic paint to the sidewalls. This was done to make the paint adhere to the tires. Not only do they use the Stow Jiffy Tool machine for roughing up the tires, but when the paint dries, a cloth buffer is attached to the shaft and is used to touch up any defective spots.



(Top) grinding welds on large frames cuts operation costs; **(center)** sanding thin metal-covered fire doors; **(bottom)** grinding forging dies saves 4½ hours per week.

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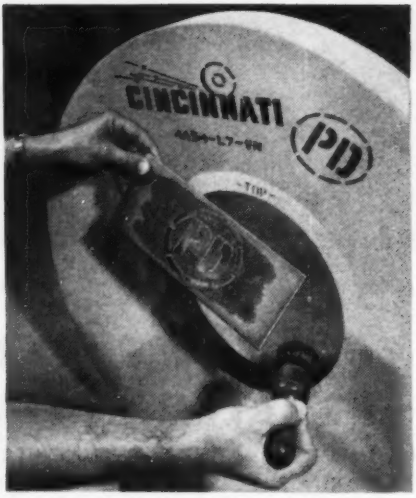

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PD POSITIVE DUPLICATION

The CINCINNATI (PD) Manufacturing Process is the greatest grinding wheel development in years—an achievement in precision manufacturing and quality control that means a brighter working picture for you.

Through the CINCINNATI (PD) Manufacturing Process, you can be *positive* that *every* CINCINNATI (PD) Wheel you order will be produced exactly to the Cincinnati grading specified for your job.

And, just as a negative guarantees exact duplication of a photograph, the CINCINNATI (PD) Manufacturing Process assures a POSITIVE DUPLICATION of the original wheel EVERY time you reorder.

The problem of duplication has been a major concern of Cincinnati Milling throughout its 30 years of practical experience in using grinding wheels, and in supplying industry with precision grinding machines equipped with grinding wheels and ready for production operation. Cincinnati Milling found that once the right grinding wheel had been specified for a particular job, sometimes it was difficult to secure additional wheels of identical grading that would duplicate the performance of the original wheel. The need for positive duplication in the manufacture of grinding wheels is of utmost importance not only to Cincinnati Milling, but to every user of grinding wheels.

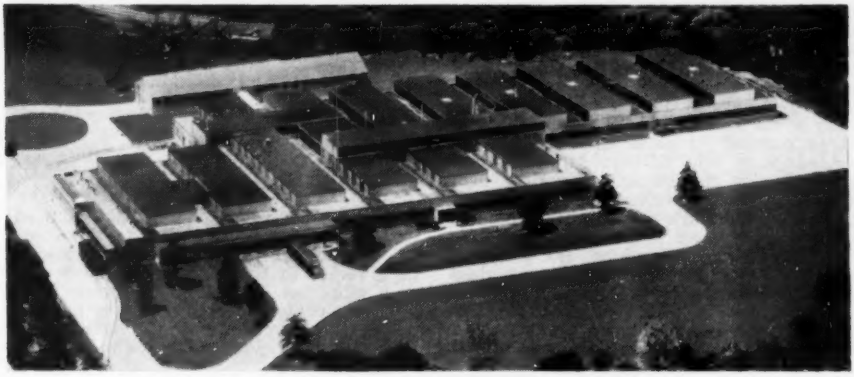
Positive Duplication (PD) is the result of extensive manufacturing research which revealed that *several steps* in the production of grinding wheels generally considered as unimportant, were quite to the contrary, *extremely important*. As one step toward (PD) Wheels, Cincinnati Milling constructed the world's most modern, most completely equipped grinding wheel plant. Some of the equipment installed has never before been used by the industry in the manufacture of grinding wheels.

Then, to make (PD) Wheels an actuality, Cincinnati Milling developed new standards of manufacture with 36 quality control steps. From the weighing of the grain and bonding material, through molding, drying, firing, finishing, to final inspection, every operation is

carried out with the same exactness as in building a precision machine tool.

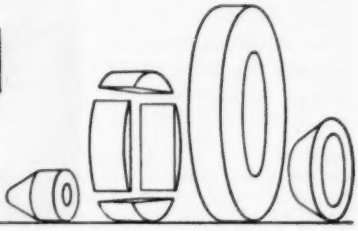
You're assured a POSITIVE DUPLICATION of the original wheel EVERY time you reorder. "On grade" with a CINCINNATI (PD) Wheel means all future (PD) wheels will act and grind exactly alike. For you, this means *no more* production interruptions which cut output and increase your costs.

Let us prove to you how CINCINNATI (PD) Wheels will make money for you. Just contact us and we'll send one of our representatives—men who know grinding and grinding machines as well as grinding wheels. Write, wire or 'phone Sales Manager, Cincinnati Milling Products Division, The Cincinnati Milling Machine Co., Cincinnati 9, Ohio.



The CINCINNATI (PD) Manufacturing Process was made possible by this plant—the world's most modern grinding wheel plant.

CINCINNATI
Grinding Wheels
THE CINCINNATI MILLING MACHINE CO.
Cincinnati 9, Ohio



Flow gun solves adhesive application problem for Crosley

Rapid and convenient application of adhesives used in refrigerator assembly doesn't require an expensive solution. Engineers of Crosley Division, Avco Mfg. Corp., Richmond, Ind., seeking a fast, inexpensive, yet foolproof method of application found the answer to their problem by using a small rubber bulb fitted with the proper size nozzle.

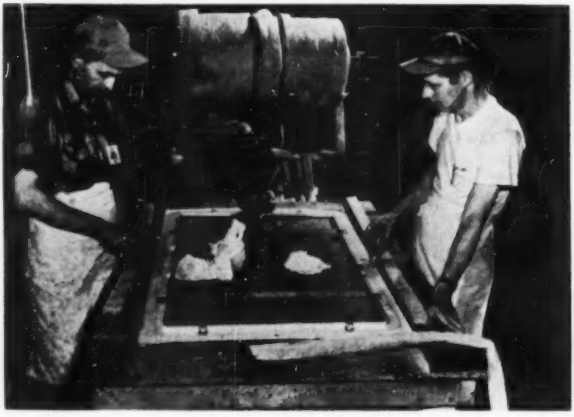
A nozzle opening of ⅛" dia. produces a bead about ¼" wide, suitable for Crosley's bonding operations. Used to apply several types of adhesives supplied by the Adhesives and Coatings Div., Minnesota Mining and Mfg. Co., 423 Piquette Ave., Detroit 2, Mich., this method can be used in a confined area, keeps dripping and spillage to a minimum and lays down a comparatively uniform adhesive bead.

Because this new type of "flow gun" can be handled with one hand and requires only a slight pressure to operate, it eliminates fatigue and permits a high production rate. Filling is simple and quick, the nozzle is removed and adhesive is poured directly into the bulb. It takes only a few seconds to fill the bulb and a large number of parts can be adhesive coated with one filling. An additional advantage is that should the flow unit fall over, no adhesive is spilled. If it falls from the work table to the floor, the bulb bounces and is not damaged.

In one of the operations, 3M adhesive EC-871 is used for bonding fibrous glass insulation strips to a one-piece plastic trim frame. The fibrous glass strip is pressed into contact with the adhesive within a few seconds. A two-man team can produce 1200 insulated trim frames in an eight-hour shift.

One operator flows 3M's EC-847 adhesive onto Masonite disc that is used to help dampen sound and vibration on the Crosley refrigerator compressor.

Another adhesive, 3M's EC-847, is used in bonding a Masonite disc to the compressor housing lid. Steel shot is placed in a recess in the compressor lid to act as a vibration and sound dampener. The adhesive coated Masonite disc is pressed on, as the assemblies pass the operator on a moving conveyor, and keeps the shot in



Two operators equipped with flow guns apply 3M's EC-871 for bonding fibrous glass insulation strips to a plastic trim frame on the Crosley refrigerator.

place. Using the simple flow gun, one operator can maintain a production rate of about 1000 pieces per eight-hour shift and performs one other mechanical operation on the same number of units.

Jumbo dies for giant tube reducer

Pictured on a vertical boring mill at the Midvale Co., Philadelphia, Pa., is an 8400 lb. die section, 50" in dia., the largest of this type ever constructed. It will be used in a giant tube reducing machine which will go into operation early this summer at Tube Reducing Corp., Wallington, N.J. The new tube reducer is one of a pair of giant-sized machines that will make available for the first time cold finished compression-formed precision tubing from 5½" to 17" in outer dia.

Processing of the die at the Midvale plant began with a chrome moly roll steel ingot weighing 38,600 lbs. An upset disc was forged weighing approximately 20,000 lbs. and rough machined. Then the groove, as shown in the picture, was rough turned to minimum diameters. The die was then split longitudinally into two sections each weighing 8400 lbs. and shipped to Tube Reducing Corp. for final machining. Finished die has a 31" die face width and a 50" dia.

The die section shown is one part of a die unit as used in the tube reducer's compression forming process. A complete die unit consists of two of these sections inserted in heavy steel rolls 50" in dia. Each roll with bearings will weigh approximately 60,000 lbs.

In the compression forming process, these rolls rock back and forth over the longitudinal axis of a tube positioned between them. The tube is fitted with a polished mandrel that controls the inside finish, size and contour as the rolls compress the inside wall of the tubing around the mandrel.

This method of cold finishing tubes produces seamless tubing to closer tolerances, higher finish and a wider variety of inside contours than are usually obtained by conventional methods of cold drawing. The process was developed by Tube Reducing Corp. in 1937. Until now, this type of tubing was available only in sizes from ⅞" to 5½" in outer dia. The new giant tube reducers will extend the available sizes up to 17" in outside dia. and in wall thicknesses down to 0.125".

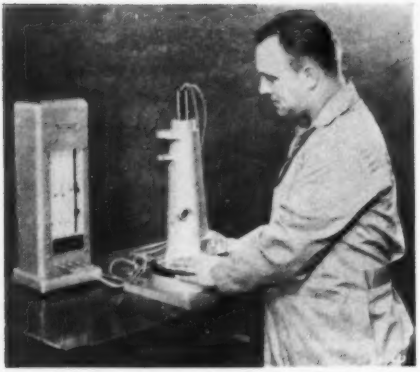
The giant tube reducers are the major machines of a 10½ million dollar naval industrial facility sponsored by the U. S. Navy Bureau of Aeronautics. The new plant is being built in Wallington, N.J. It will be operated by Tube Reducing Corp. The new large size tubing, produced by the giant tube reducers, will be used for manufacturing military and civilian items. Commercial use of the tubing will be for manufacturing aircraft parts and general purpose large-sized hydraulic cylinders, accumulators, casings and ring-shaped products that require high strength thin-walled tubing.

Pictured on a vertical boring mill at the Midvale Co., Philadelphia, Pa., is an 8400 lb. die section, 50" in dia., the largest of this type ever constructed. It will be used in a giant tube reducing machine which will go into operation early this summer at Tube Reducing Corp., Wallington, N. J.

Inspects internal bore diameters and concentricity

A Precisionaire gaging assembly to inspect two internal bore diameters and their concentricity in an automobile transmission extension housing is another interesting application of air gaging developed by The Sheffield Corp., Dept. B, Dayton 1, Ohio. The assembly consists of a three-column Precisionaire connected to a 5" gaging spindle mounted on a serrated steel base, and a hand type air spindle for measuring approximately 2" in dia. at the top of the part. A vertical locating shaft rises from the base to the top of the part. The air spindle is removable to facilitate loading and unloading the part on the gage.

All the operator has to do is to lower the part over the locating shaft so that it rests on the base and then insert the spindle in the top of the part. Instantly,



the float positions in the first two columns in the Precisionaire show whether the part is within tolerance or the amount each diameter is out of tolerance. Eccentricity is indicated by float fluctuation in the third column as the part is rotated 360°.

Extrude tough steel for jet engine rings

Extrusion of tough stainless steel grades for jet engine rings will prove to be one of the most important applications of the hot extrusion department at Allegheny Ludlum Steel Corporation's Watervliet, N. Y., plant. The company recently described a group of extrusions produced for aircraft use that show the variety of shapes available in high alloy and high temperature materials.

In the production of complicated shapes in carbon and low alloy materials rolling and machining are the best method known for economical production. When the fabricator begins to cut away large percentages of high alloy special steel, the net pound cost increases greatly and inherent advantages of hot extrusion come into focus. The hot extrusion can produce real advantages in greater yield per pound of shape in many complicated sections.

Reduce machining time

The extrusion operation also may greatly reduce machining time on some parts. In certain applications setup and machining are completely eliminated by cold drawing. Slow cutting speeds when turning high alloy materials have increased machining costs.

The use of the hot extrusion process also offers substantial advantages for the production of small quantities of materials. Mills generally are not anxious to take orders for less than 10 tons of a rollable shape to be produced on a rolling mill. The problems on the rolling mill include both the lost production time for roll changes and the expense of cutting special rolls. Unequal leg angles, with varying angularity, are produced in this manner.

On the other hand, the hot extrusion operation can be set up for a relatively small die cost, and there is little production loss involved in changing over from one shape to another on the press.

The comparatively short time required for the production of extrusion dies and the small charges involved make the method ideal for production for prototype aircraft. Small tonnages can be produced quickly for experimental purposes, and the dies are available for later larger quantity production.

Other uses

A considerable number of different cross sections have been produced for jet engine use. In addition to many applications for rings, one extruded shape is being used for aircraft chain links in place of forged links previously produced. The extruded shape is cut into sections of the desired thickness and drilled at each end to make the chain links.

Another interesting section in development outside the aircraft industry is one for use in the making of tin cans. It is being extruded of two pieces of Type 316 stainless which are joined to make a cylinder in which cans are received and soldered. The part has previously been made of carbon steel which needs to be machined, polished and chrome plated. Only finish machining of the extrusion is contemplated and it is expected to have much greater life in this application.

Comparisons have been made by Allegheny Ludlum of the grain structure of specimens of the same sections as rolled and as extruded. Grain structure in the extruded material compares favorably with that of rolled material and there have been no major problems with segregation.

Alloy grades being made into shapes at Allegheny Ludlum's Watervliet, N. Y., plant include 405, 419, 403, 430, 303C, 304, 321, 310 as well as a variety of tool steels. The company expects markets to develop in extruded shapes of high temperature superalloys, titanium and zirconium. Small quantities have been extruded on the present equipment.

Weight of Iron and Steel Sheets

Per Square Foot

	Iron	Steel
Weight, pounds per cubic foot	480.	489.6
Weight, pounds per cubic inch	.278	.283

	Copper	Brass	Aluminum
Weight of 1 cubic foot in lbs.	543.6	513.6	164.2
Weight of 1 cubic inch in lbs.	.315	.297	.095

To Compute The Weight of Sheet Iron

Multiply the thickness in inches by 40; the result is the weight in pounds per square foot.

Example: A piece of Sheet Iron is .005 inch thick, its weight is .005 x 40 = .200 lb. per square foot.

To Compute The Weight of Sheet Steel

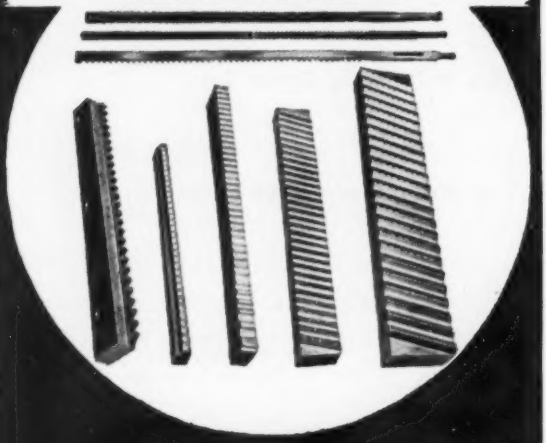
Multiply the thickness in inches by 40.8; the result is the weight in pounds per square foot.

Example: A piece of Sheet Steel is .005 inch thick, its weight is .005 x 40.8 = .204 lb. per square foot.

No. of Gauge	Thickness by Birmingham Gauge			Thickness by American Gauge (Brown & Sharpe's)		
	Thickness in Inches	Iron Lbs.	Steel Lbs.	Thickness in Inches	Iron Lbs.	Steel Lbs.
1	.3	12.00	12.24	.2893	11 57	11.80
2	.284	11.36	11.59	.2576	10.30	10.51
3	.259	10.36	10.57	.2294	9.18	9.36
4	.238	9.52	9.71	2043	8.17	8.34
5	.22	8.80	8.98	.1819	7.28	7.42
6	.203	8.12	8.28	1620	6.48	6.61
7	.18	7.20	7.34	.1443	5.77	5.89
8	.165	6.60	6.73	.1285	5.14	5.24
9	.148	5.92	6.04	.1144	4.58	4.67
10	.134	5.36	5.47	.1019	4.08	4.16
11	.12	4.80	4.90	.0907	3.63	3.70
12	.109	4.36	4.45	.0808	3.23	3.30
13	.095	3.80	3.88	.0720	2.88	2.94
14	.083	3.32	3.39	.0641	2.56	2.62
15	.072	2.88	2.94	.0571	2.28	2.33
16	.065	2.60	2 65	.0508	2.03	2.07
17	.058	2.32	2.37	.0453	1.81	1.85
18	.049	1.96	2.00	.0403	1.61	1.64
19	.042	1.68	1.71	.0359	1.44	1.46
20	.035	1.40	1.43	.0320	1.28	1.31
21	.032	1.28	1.31	0285	1.14	1.16
22	.028	1.12	1.14	.0253	1.01	1.03
23	.025	1.00	1.02	.0226	.904	.922
24	.022	.88	.898	.0201	.804	.820
25	.02	.80	.816	.0179	.716	.730
26	.018	.72	.734	.0159	.636	.649
27	.016	.64	.653	.0142	.568	.579
28	.014	.56	.571	.0126	.504	.514
29	.013	.52	.530	.0113	.452	.461
30	.012	.48	.490	.0100	.400	.408
31	.01	.40	.408	.0089	.356	.363
32	.009	.36	.367	.0080	.320	.326
33	.008	.32	.326	.0071	.284	.290
34	.007	.28	.286	.0063	.252	.257
35	.005	.20	.204	.0056	.224	.228

American BROACHES

LAST LONGER ★ IMPROVE FINISH ★ REDUCE RESHARPENING

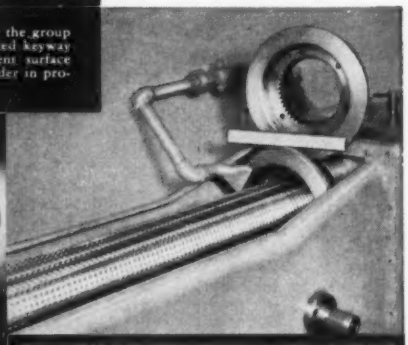


Shown above are a variety of *American* broaches. Included in the group are a round spline broach, a combination internal and inserted keyway broach, and a keyway broach. Also five sections of different surface broaches. In use, these sections are mounted in a broach holder in progressive stages to form a complete unit.

For every broaching operation, you are sure of better performance and longer life when you specify *American* broaches. *American* broaches give you efficient, dependable production on every type of broaching operation—on keyways, on internal operations such as splines and finishing holes, and surface operations on flats, cams, or irregularly shaped parts.

For the greatest broach economy, efficiency and dependability, insist on *American* broaches, made by a company with more than a quarter of a century's experience in the design and manufacture of broaches, broaching machines, and fixtures.

American offers a complete line of push and pull heads to help you get maximum value from your broaches. All types are available, correctly designed for round, flat, keyway, spline, and odd-shaped broaches. A free catalog gives complete data on *American* push and pull heads. Write for your copy today. Ask for Circular



More than 35,000 gears have been broached to date on this *American* broach, and the broach still has a life expectancy of 35,000 more. The secret of obtaining high production from a well-made broach is proper sharpening at regular intervals. For best results, follow the manufacturer's instructions implicitly: improper sharpening can ruin a good broach. Send for *American's* free catalog on broaches. Just ask for Circular

AMERICAN

American BROACH & MACHINE CO.

A DIVISION OF SUNDSTRAND MACHINE TOOL CO.

ANN ARBOR, MICHIGAN

SUNDSTRAND

See *American* First — for the Best in Broaching Tools, Broaching Machines, Special Machinery

Theoretical Weights of Sheet Steel Blanks in Pounds

To Compute The Weight of Sheet Steel

Divide the thickness, expressed in thousandths of an inch, by 25; the result is the weight, in pounds, per square foot. See previous page.

Specific Gravity Iron and Steel

	Iron	Steel
Specific gravity	7.7	7.854
Weight per cubic foot	480.	489.6
Weight per cubic inch	.2779	.2834

As there are many gauges in use differing from each other, and even the thicknesses of a certain specified guage, as the Birmingham, are not assumed the same by all manufacturers, orders for sheets and wires should always state the weight per square foot or the thickness in thousandths of an inch. See previous page.

Diam.	1/8	3/16	1/4	5/16	3/8	7/16	1/2
16	7	11	15	18	22	25	29
17	8	12	16	20	24	28	32
18	9	14	18	23	27	32	36
19	10	15	20	25	30	35	40
20	11	17	23	28	34	39	45
21	12	19	25	31	37	43	49
22	14	20	27	34	41	47	54
23	15	22	30	37	44	52	59
24	16	24	32	40	48	56	64
25	18	26	35	44	53	61	70
26	19	28	38	47	56	66	75
27	20	30	41	51	61	71	81
28	22	33	44	55	65	76	87
29	24	35	47	59	71	82	94
30	25	38	50	63	75	88	100
31	27	40	54	67	80	94	107
32	29	43	57	71	86	100	114
33	30	45	61	76	91	106	121
34	32	48	65	81	97	113	129
35	34	51	68	85	102	119	136
36	36	54	72	90	108	126	144
37	38	57	76	95	115	134	153
38	40	60	80	100	121	141	161
39	42	64	85	106	127	148	169
40	45	67	89	111	134	156	178
41	47	70	94	117	141	164	187
42	49	74	98	123	148	172	197
43	52	77	103	129	155	180	206
44	54	81	108	135	162	188	215
45	56	85	113	141	169	197	225
46	59	88	118	147	177	206	235
47	62	92	123	154	185	215	246
48	64	96	128	160	193	225	257
49	67	100	134	167	201	234	267
50	70	105	139	174	209	244	279
51	...	109	145	181	217	253	289
52	...	113	151	188	226	263	301
53	...	117	156	195	235	273	313
54	...	122	162	203	244	284	325
55	...	126	168	210	253	295	337

Theoretical Weights of Sheet Steel Blanks in Pounds

Diam.	1/16	5/32	11/64	3/16	13/64	7/32
36	162	180	198	216	234	252
37	172	191	210	229	248	267
38	181	201	221	241	261	281
39	190	212	233	254	275	296
40	200	223	245	267	289	312
41	211	234	258	281	304	327
42	221	246	270	295	319	344
43	232	258	283	309	335	360
44	242	269	296	323	350	377
45	253	282	310	338	366	394
46	265	294	324	353	383	412
47	277	308	338	369	399	430
48	289	321	353	385	417	449
49	301	334	367	401	434	467
50	313	348	383	418	452	487
51	325	362	398	434	470	506
52	339	376	414	452	489	527
53	352	391	430	469	508	547
54	365	406	446	487	527	568
55	379	421	463	505	547	589
56	393	436	480	524	567	610
57	407	453	498	543	587	633
58	421	468	515	562	609	655
59	436	484	533	581	629	678
60	451	501	551	601	651	701
61	466	518	569	621	673	724
62	482	535	589	642	695	749
63	497	553	608	663	718	774
64	513	570	627	684	741	798
65	529	588	647	706	764	823
66	546	607	667	728	788	848
67	563	625	688	750	812	874
68	579	643	708	772	836	900
69	596	663	729	795	861	927
70	613	682	750	818	886	954
71	631	702	772	842	912	982
72	649	722	794	866	937	1009
73	667	742	816	890	964	1038
74	686	763	839	915	990	1066
75	704	783	861	939	1017	1095

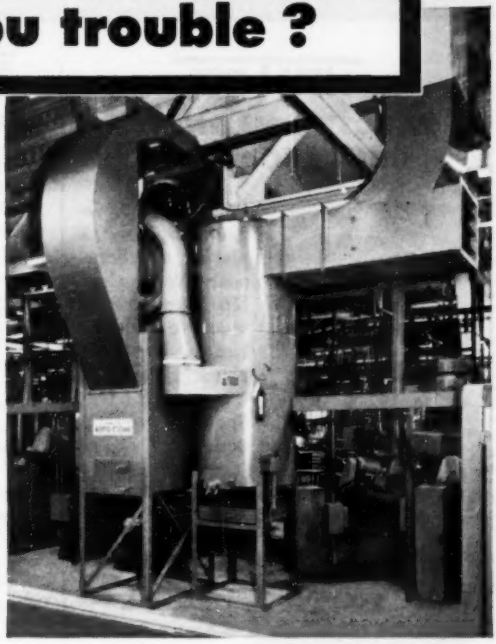
Table of Polygons

S—Side of Polygon.
R—Radius of Circumscribed Circle.
r—Radius of Inscribed Circle.
A—Angle formed by the intersection of the sides.

Area of any regular polygon = radius of inscribed circle x ½ number of sides x length of one side.

Name	No. of Sides	A	Area = $S^2\times$	S = R×	S = r×
Trigon	3	60°	.4330	1.732	3.4641
Pentagon	5	108°	1.7205	1.1755	1.4536
Hexagon	6	120°	2.5980	1.0000	1.1547
Octagon	8	135°	4.8284	.7653	.8284
Decagon	10	144°	7.6942	.6180	.4398

Cast Iron Machining Dust giving you trouble ?



ROTO-CLONE Dust Control Offers the Solution!

Cast iron dust has long presented a collection problem. Now, with increased machine tool speeds and the tendency to concentrate a greater number of operations in a given area, there is an ever-increasing demand for a practical solution.

And here's the answer. Scores of companies are using Type D ROTO-CLONES successfully to exhaust and collect fine, floating cast iron dust from their machining operations. Whether it's drilling, reaming, boring, milling, turning or gear cutting, you are assured of positive dust control. The Type D ROTO-CLONE is the most widely used dust collector in industry today. Its advantages are many—constant efficiency under all operating conditions, uniform air volume, small space requirements and ease of installation. When desired, a Cycoil Oil Bath After-Cleaner can be added which will provide the necessary cleanliness to permit recirculation of the cleaned air to the workroom.

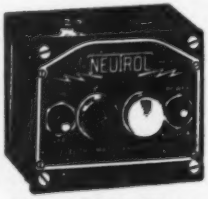
For complete information on the application of the Type D ROTO-CLONE to cast iron machining operations, call your local American Air Filter representative or write direct to—

American Air Filter
COMPANY, INC.
312 Central Avenue, Louisville 8, Kentucky
American Air Filter of Canada, Ltd., Montreal, P. Q.

ELECTRICAL CONTROLS FOR INDUSTRY

NEU-TROL

ELECTRO-MAGNETIC CHUCK CONTROL



50 to 15,000 Watts . . . 60 to 20,000 Sq. In. Chuck Area.

Releases and demagnetizes work pieces simultaneously. No time lost. No damage to work or chuck face. Protects chuck from voltage surges. Speeds production.

ELECTRO-MATIC RECTIFIER

50 Watts to 40 Kilowatts

Engineered for dependable power conversion in constant year after year service. Quiet and efficient. For all industrial applications.

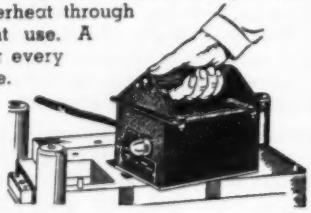
NEUTROLATOR

NEUTROL CHUCK CONTROL and HOLDING POWER REGULATOR

Combines the advantages of NEU-T-ROL with the benefits of absolute voltage regulation. Control of holding power is infinitely variable through entire dial range. Best holding power predetermined for an operation is automatically repeated. Assures true parallel grinding. Manual or automatic control models.

ELECTRO-MATIC A.C. DEMAGNETIZER

Demagnetizes dies, punches, cutters, tools that have been magnetized from any source. Works by simple contact. Operates on standard A.C. voltage. Will not overheat through constant use. A size for every purpose.



All Models Fully Warranted

Special Models Engineered to Meet Every Need

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A special report by the editors of MACHINE and TOOL BLUE BOOK

Report number 39

Presses . . . part 1

This is the thirty-ninth in a monthly series of special reports discussing various types of machine tools. Included in this month's special report on presses are:

1. Reduce costs with dial feeds.
2. Descriptions of late model presses.
3. Specifications of American-built machines.

Previously published reports discussed: 1. Thread Rolling; 2. Power Press Brakes; 3, 4, 5. Milling Machines; 6. Honing, Lapping, and Superfinishing; 7. Automatic Screw Machines; 8. MAPI Replacement Formula; 9, 10. Chucking Machines, Turret Lathes, Hand Screw Machines; 11. Broaching Machines; 12. Shapers, Slotters, Keyseaters; 13, 14, 15. Lathes; 16. Planers; 17. Gear Making Machines; 18, 19. Boring Machines; 20, 21, 22, 23, 24, 25, 26. Drilling Machines; 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, Grinding Machines.

Reduce Costs with Dial Feeds

By **William W. Schug**
The V & O Press Co.,
Division of Emhart Mfg. Co.
Hudson, N.Y.

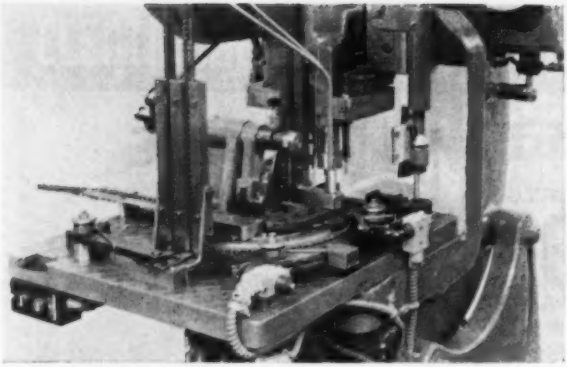
THE MAJOR purpose of a dial feed, like that of any power press attachment, is to increase production while keeping costs to a minimum. Whenever tooling becomes too complicated for progressive operations within the press or when additional operations are required, the attachment of some type of dial feed should be considered.

Only individual production requirements can determine whether it is economically feasible to equip the press with a dial feed. Generally speaking, where there are variations in the part, it is probable that secondary operations can be accomplished not only more quickly but at lower unit cost and with greater accuracy when a dial feed is attached.

The type of dial feed indicated depends entirely upon individual requirements. The nature of the job, the required speed of operation, the length of the movement and the stability of the part are all factors to be considered in selecting the proper dial feed.

Dial feeds may be classified according to the method by which they are indexed: ratchet driven, friction driven, Geneva motion driven, roller gear driven and air or hydraulic driven.

The friction and roller gear driven dials can be operated at much higher



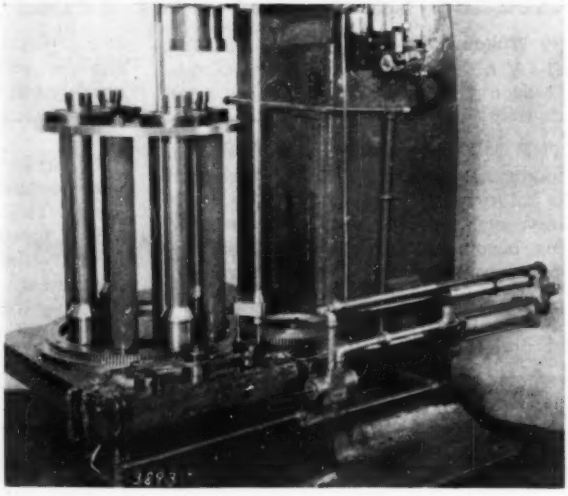
Roller chain components are carried on the outside edge of this dial feed. Links are fed from magazines, other parts from hoppers. Components are fed at the front and rear of the dial, the finished chain coming out at the left.

speeds than the ratchet driven dial, which is the type most commonly used. The air or hydraulic driven dial is ordinarily used when the speed is quite low.

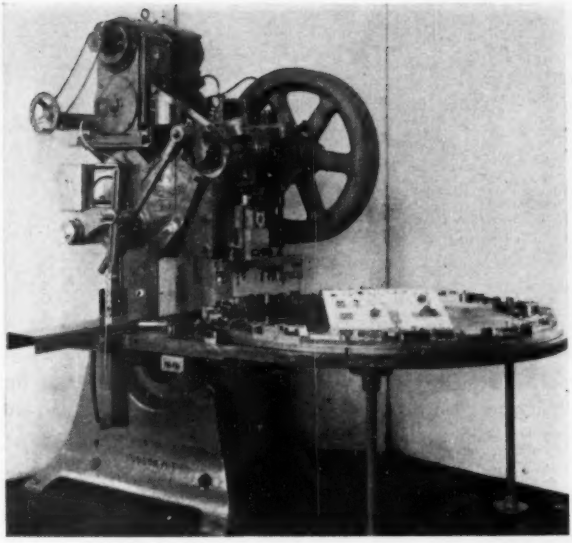
Speed is only one of the relevant factors. The advantage of the air or hydraulic driven dial, for example, is that it is driven independently of the press and usually controls the press cycle. The roller gear type is in general more versatile and smoother in operation. A friction dial is particularly suitable where size of the part is not too large and speed is an important consideration.

The simplest forms of dial feeds enable the press to perform such relatively routine tasks as redrawing or forming with greater accuracy, speed and safety. The more complex dial feeds may be used to turn the press into a complete production unit, allowing the press to produce several different parts from multiple strips, blank and form them, and assemble.

Raw material and parts are brought to the press in one of three ways: by



Safety considerations dictated use of this air driven dial feed, employed in the production of 105 mm shells. Driven independently of the press, the dial trips the press after the correct position is reached. As an added precaution, the machine is equipped with a safety stop.



One of the largest dial feeds ever built, this 60" unit has eight stations and is manned by six persons. It was engineered by The V & O Press Co. for T. Cohn & Co., Brooklyn, N. Y., for assembling part of a toy airport. The board in the center shows the various assemblies and sub-assemblies performed.

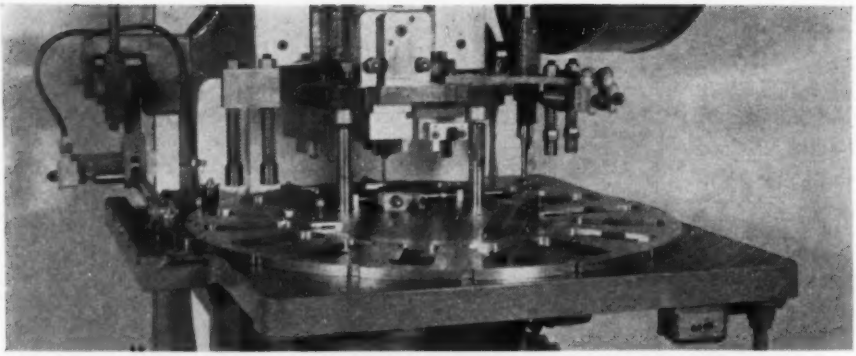
an automatic feed, by hand feeding or by a combination. The most common types are the magazine, hopper and chute feeds. Also used are roll, slide and conveyor feeds.

A combination of feeds and a dial perform a rather unusual operation for Ornstein and Co., England. This company uses a press to make cloth button backs. Using an 01 press with dial feed, the complete operation is handled on a single press. The shallow cup-shaped metal button back is fed from a hopper to the dial which brings it into position where a round disc of cambric, fed by a roll feed, is punched out slightly larger than the button back and inserted into the hole in the metal cup. By means of a magazine feed, a strawboard disc is cut and delivered to the dial which positions the disc so that it may be pressed on top of the cambric. The dial enables the press to deliver 125 completed pieces per minute.

Friction driven dial feeds are applicable to high speed operation. Elastic Stop Nut Corp., for example, uses a 200 spm dial feed with a No. 2 press to assemble locking washers to nut blanks and to crimp them into position. This press also has a hopper for feeding nuts and a roll feed for the locking medium. These machines can operate up to 350 spm.

Dial feeds are sometimes of unusually large diameter. They are employed particularly where several operators are required to position parts for various operations within the dial. A dial measuring 60 inches in diameter and having eight stations is used by T. Cohn & Co., Brooklyn, N.Y., in assembling part of a toy airport. This one machine, manned by six persons, produces and assembles 14 pieces a minute. Despite the complexity of the unit, tooling is simple and inexpensive.

Many combinations of tooling units and feeds are possible in assembly operation. A good example is a press used in assembling ice tray separators. Two blanks are fed from separate magazines to the dial and then a riveting operation and a two-station forming operation are



This dial equipped press performs three forming operations to a decorated tin part, for Columbia Specialties Corp., Baltimore, Md. The addition of a magazine feed boosted production from 50 to 70 pieces per minute.

performed. The parts are automatically ejected at the rate of 65 per minute. This multiple-operation machine does the work of many operators using single operation tooling.

A single press serves P. R. Mallory and Co., Inc., Tarrytown, N. Y., as the basis of a complete production unit. Equipped with dials, the machine performs all the operations involved in assembling small hearing aid batteries. Three operators, each with his own emergency stop, work on this unit and produce 48 complete batteries per minute.

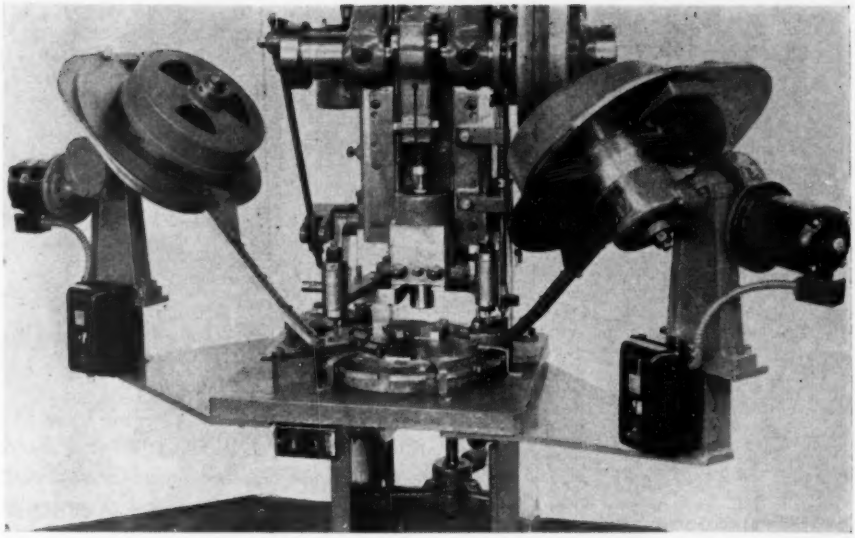
A special No. 43 press, equipped with an air driven dial, is used for the production of 105 mm shells. The dial trips the press after the correct position is reached. In this operation speed is variable, averaging about 13 pieces per minute. For added safety, the machine is equipped with a safety stop.

A different type of dial feed is used in a notching press. The main difference between a standard dial and a notching fixture is that only a central spindle is employed. The spindle carries the lamination to be notched over the die. Notching fixtures are used for blanks as small as 1" diameter with a ⅜" hole and for very large blanks produced from one sheet of silicon steel.

Another dial feed fixture consists of a ring driven by friction, ratchet pawl or gear. These fixtures, which are used for punching stator laminations, are made in sizes up to 72 inches in diameter.

In both notching and ring-type fixtures, the operator loads the blank on the center spindle or outer ring and trips the press. The press stops for unloading after one revolution of the fixture. In the ring-type, however, when segments are used, the fixture and the press operate continually while the operator loads and unloads the laminations. These machines, in large sizes, operate at speeds up to 400 spm.

The changes in production methods which the use of a dial feed sometimes involves may at first appear to present a problem. Parts may have to be produced to closer uniformity than before. The final result, however, is usually the production of a better product at reduced costs. Again, use of the dial may require more uniform material, but this also generally reflects itself in a better product.



Fed by two hoppers, this dial is used by Simmons Air Accessory Corp., Vergennes, Vt., in assembling a two piece lock nut. Nuts and caps are crimped together and ejected automatically at the rate of 125 per minute.

Use of a dial feed likewise makes demands upon the operator. He must learn to synchronize his motions to the dial rather than to the press. Also, if the dial feed is to be hand fed, he should be ambidextrous so that he can use both hands. He should have sufficient dexterity to perform more than one action at the same time and be able to determine rapidly what for him is the best method of positioning the parts. If the operator is not charged with press adjustment, he requires no more skill than any other power press operator.

The great diversity of tasks which dial feeds have been called upon to perform may be regarded as an indication of what may be achieved in the future. Each day new and challenging problems are being faced and solved. The dial feed has led to increased production, lowered costs and greater operator safety in many types of power press operation.

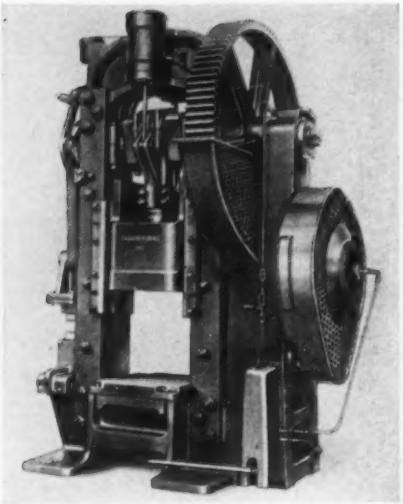
The End.

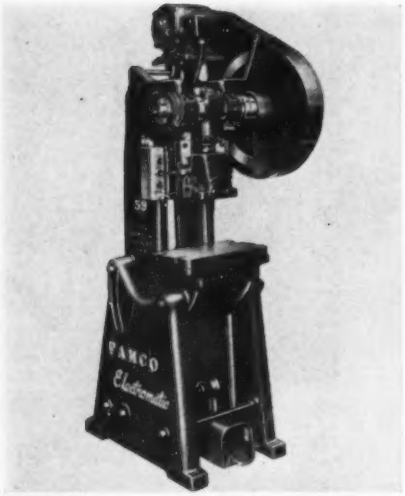
Descriptions of late model presses

Chambersburg trimming presses

This is the No. 200 geared press with pneumatic clutch, a steel side trimming press. This type has been designed principally as a trimming press for forge shop use. Sturdiness in performing the trimming and sizing operations common to forge shops has encouraged their use for all forms of blanking, punching, bending and shaping. Strength is due to the design of forged steel side frames, a tongue-and-groove construction that binds the base, uprights and yoke into a rigid structure.

The clutch on this model is of air operated, multiple disc type, designed integral with flywheel. The heavy clutch





housing and flywheel rim are a single gray iron casting.

Because of the patented interlocking steel side frame construction and the friction slip mechanism, the Chambersburg press is unusually strong. Interlocking prevents side sway and the friction slip mechanism prevents locking, jamming, and breaking when the press is stalled through overload. Chambersburg Engineering Co., Chambersburg, Penna.

Famco 18-ton OBI with Electromatic clutch

Famco Machine Co., Kenosha, Wis., introduces a new principle in small press operation with the Electromatic clutch, combining the simplicity of electric control with the ruggedness and positive, efficient performance of jaw clutches.

The selector switch provides ready changeablility from single stroke to continuous operation, from on to off positions, plus a neutral position which locks the clutch, making hand or foot controls inoperative.

Features claimed for the press include: Efficiency, economy, safety, long life, ease of operation, simplified clutch control—single stroke, non-repeat, neutral, or continuous operation in or out of operation.

Max Ams inclinable presses

The Max Ams Machine Co., Bridgeport 5, Conn., manufactures inclinable power presses from 9 to 72 tons capacity, also horning and straight sided presses.

Some of the features are: Heavy-duty frames — ample depth at crankshaft bearings and throat, bearings for back gearing cast in frame, crank bearings bridged with heavy rib cast integral with frame, crankshaft—extra long bearings, extra width at cheeks, precision machined; inclining screws—positive, safe, ball bearing thrust collar for ease in adjusting; non-repeat device—integral unit that replaces standard clutch housing cover, and others.

Robinson Model A-5 with air clutch

Because the air clutch transmits power through a "cushion" of air which absorbs shock and vibration, wear and tear on the press is reduced. The desired degree of grip is obtained by setting the air pressure regulator. Instant control is obtained through the split-second response of air pressure free from mechanical linkages or levers. Electric con-

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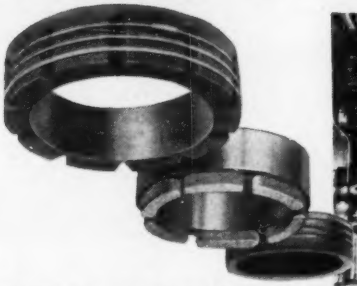

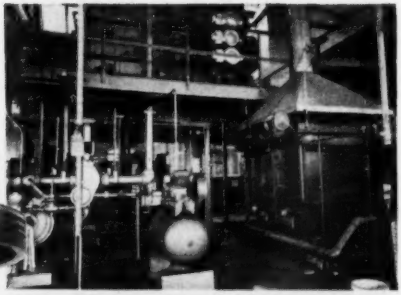

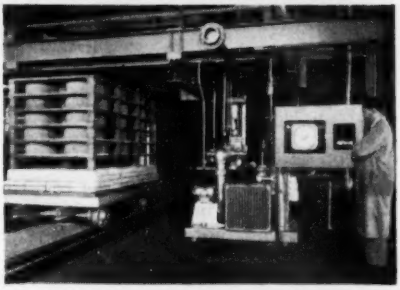

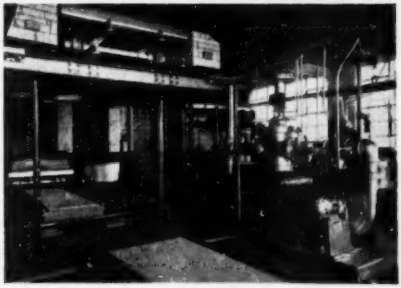

VITRIFIED WHEELS

For more than 25 years, Blanchard has directed its efforts toward developing the best grinding wheels for Blanchard Surface Grinders. It began by pioneering with silicate bonded wheels, and then resin bonded wheels. Now, from a new, ultra modern Blanchard wheel shop come *vitrified wheels* ... scientifically batched, pressed and fired ... with positive control of time and temperature.

Today, Blanchard offers complete wheel service ... silicate, resin and vitrified!

Use Blanchard wheels on your Blanchard Surface Grinder. They do a better job in less time, with less trouble and cost ... whether your work is tough as copper or fragile as glass ... whether it requires heavy roughing cuts or clean-up cuts with flatness to .000005" and finish of 1 micro-inch.

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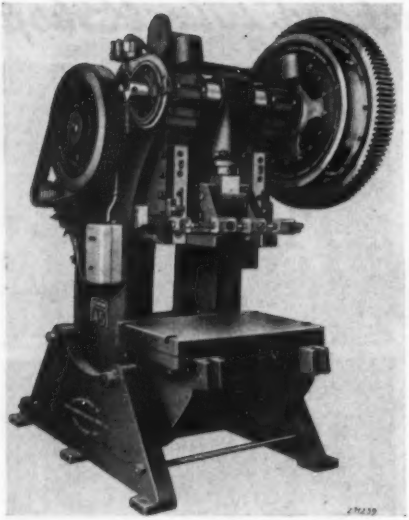
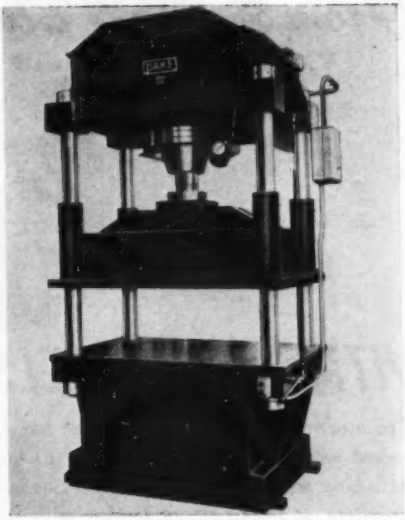




trols consist of two run buttons, one stop button and one inch button operated on 110 volt current regardless of whether motor current is 220 or 440 volts.

Clutch torque output is in direct ratio to applied air pressure and is controlled by pressure regulator valve. Clutch is reversible; by reversing wires on motor it is possible to inch out of a stall.

Robinson presses are made by New Albany Machine Mfg. Co., New Albany, Ind.

Dake die try-out presses

The Dake die try-out press is especially designed for application in the die shop, and is a valuable tool for the diemaker, in performing tests during the various stages of die production—from early development work until the time samples are run with the finished die.

This machine is suitable for: Development work—in initial stages, sizes, shapes of blanks, length of bends can be surveyed; testing—permits samples to be run for approval by customer before die is delivered; production—can be employed for short production runs. The try-out press is also adaptable to shear, assemble and align punches and dies; broach holes in dies; spot-in irregularly shaped forming and drawing dies; separate large or stubborn dies; assemble, disassemble press-fit components. Dake Engine Co., Grand Haven, Mich.

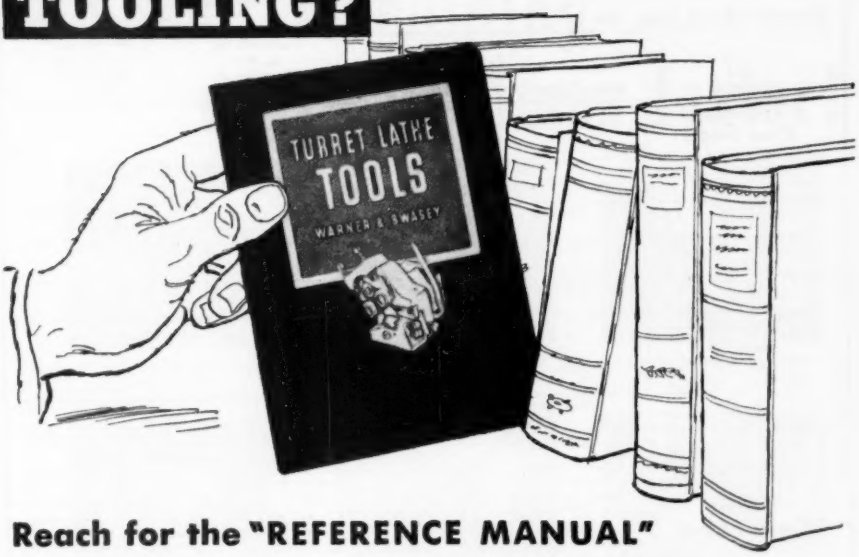
Special Reports Available in Book Form

The first 38 Special Reports on American Built Machine Tools are available in book form. The first volume includes: Automatic Screw Machines; Turret Lathes, Chucking, Hand Screw Machines; Broaching Machines; Milling Machines; Honing, Lapping, Superfinishing; Shapers, Slotters, Keyseaters; Planers; Lathes; Thread Rolling; Press Brakes.

Available from MACHINE and TOOL BLUE BOOK, Wheaton, Ill., for $3.00. 290 pages.

Volume 2 includes: Drilling Machines; Grinding Machines; Gear Making Machines; Boring Machines; MAPI Replacement Formula. Available from MACHINE and TOOL BLUE BOOK, Wheaton, Ill. $4.50. 466 pages.

TOOLING?



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Specifications of American built machines

Chambersburg Eng. Co. — Chambersburg, Pa.

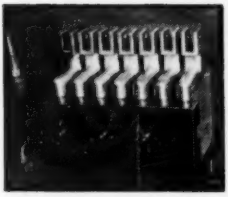
Type and Model	Rating (Tons)	Dia. Crankshaft at Main Bearing	O=Opening in Bed A=Area of Bolster Plate	ST=Stroke (Standard) SH=Shut Height
Trimming Press Single Geared				
No. 80	80	5″	O=12″ dia; A=18″ x 24″	ST=5½″; SH=22¾″
No. 100	100	5¾″	O=14″; A=22″ x 27″	ST=6″; SH=26½″
No. 150	150	7″	O=16″; A=27″ x 33″	ST=6″; SH=28″
No. 200	200	9″	O=18″; A=31″ x 36″	ST=7″; SH=31½″
Double Geared				
No. 300	300	10½″	O=20″; A=37″ x 40″	ST=8″; SH=36″
No. 500	500	12½″	O=22″; A=41″ x 44″	ST=9″; SH=39″
No. 800	800	15″	O=24″; A=46″ x 50″	ST=10″; SH=43″
Double Crank Presses	Specifications same as above, except bolster plate size: No. 80 = 25″ x 44″ narrow; No. 80 = 25″ x 70″ wide; No. 100 = 28″ x 47″ narrow; No. 100 = 28″ x 75″ wide; No. 150 = 34″ x 53″ narrow; No. 150 = 34″ x 81″ wide; No. 200 = 38″ x 61″ narrow; No. 200 = 38″ x 87″ wide; No. 300 = 42″ x 69″ narrow; No. 300 = 42″ x 93″ wide; No. 500 = 48″ x 81″ narrow; No. 500 = 48″ x 105″ wide.			
Hydro-Pneumatic Presses		Between Columns	Standard Bed	Stroke
No. 50	50	36″	30″ x 60″	18″
No. 75	75	do	do	do
No. 100	100	do	do	24″
No. 125	125	do	do	do
No. 150	150	do	30″ x 72″	do
No. 250	250	do	36″ x 120″	do
No. 300	300	42″	42″ x 72″	do

The Max Ams Machine Co. — Bridgeport 5, Conn.

Type and Model	Rating (Tons)	Dia. Crankshaft at Main Bearing	O=Opening in Bed A=Area of Bed	SH=Shut Height ST=Stroke
O.B.I. Presses				
121-H	9	1⅞″ x 2¼″	O=4¾″ x 8¼″ A=8½″ x 14″	SH=5½″ ST=1½″
126-H	16	2¼″ x 2½″	O=5⅛″ x 9½″ A=10″ x 17½″	SH=8″ ST=2″
131-H	30	3″ x 3¼″	O=8″ x 12½″ A=13″ x 24″	SH=9½″ ST=2½″
138-H	40	3½″ x 4″	O=12½″ x 15½″ A=19½″ x 27″	SH=10½″ ST=3″
145-H	52	4″ x 4½″	O=12″ x 19″ A=23″ x 35″	SH=12″ ST=3″
150-H	72	4½″ x 5″	O=14″ x 21″ A=26″ x 35″	SH=12½″ ST=3″

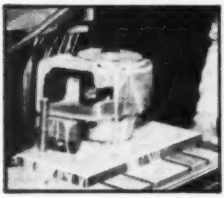
Do your machining up to 10 times faster!

● Originally turned on lathe, now rough and finish-ground at 600 per hour.



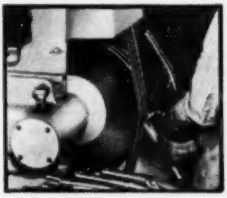
● These pieces formerly *milled* now belt-ground 5 times faster.

● Grinds broad areas flatter and faster than *radial surface grinder.*



● This grinding operation 100% faster than former *milling* time.

● Generates 2 radii at double the *output* by *hand filing* and *polishing.*



● Replaces *polishing jack* — eliminates costly setting up of glued wheels.

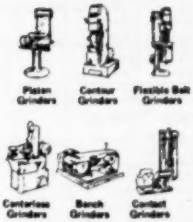
Porter-Cable ABRASIVE BELT GRINDERS

Abrasive Belt Grinding removes stock rapidly, provides fine finish free of tool marks. Greatly simplifies fixtures — or eliminates them entirely. (Often makes hand presentation possible.) Is up to 10 times faster than milling, shaping, polishing or ordinary grinding — frequently saves 75% to 90% of previous set-up time.

Wet-belt or dry-belt models (determined by material to be worked) available for flat surfacing, contour grinding, centerless grinding, generating radii, beveling, burring and polishing.

Let us prove that an Abrasive Belt Grinder can reduce the cost of many operations. Send us sample pieces for recommendations — or ask to have one of our production engineers discuss your problems at your convenience, at your plant. Free 32-page case history booklet on request.

Grinders for every application



Announcing . . .

Porter-Cable Abrasive Belt Grinders are now made and sold by Engelberg Huller Co., Inc.—manufacturers of precision machinery since 1888.

The ENGELBERG HULLER CO., INC.

807 West Fayette Street Syracuse, N. Y.

Rockford Iron Works — Chicago 43, Ill.

Type and Model	Rating (Tons)	Dia. Crankshaft at Main Bearing	O=Opening in Bed A=Area of Bed	ST=Stroke (Standard) SH=Shut Height
Straight Side Tie Rod No. 407	240	7″ and 10½″	O=16″ x 16″ A=28″ x 28″	ST=6″; SH=14½″
No. 409	400	9″ and 13½″	O=16″ x 16″ A=48″ x 30″	ST=8″; SH=18″
Double Crank Tie Rod No. 5½-50	140	5½″ and 8½″	O=21″ x 42″ A=32″ x 40″	ST=7″; SH=20″
Adjustable Bed No. 22R	20	2¼″ and 3½″	O=8″ x 10″ A=16″ x 20″	ST=2″; SH=4″ x 11″ min. and max.
No. 23R	26	2½″ and 3¾″	O=9″ x 12″ A=20″ x 23½″	ST=2″; SH=5½″ x 16″ min. and max.
No. 24R	37	3″ and 4½″	O=10″ x 15″ A=20″ x 26″	ST=3″; SH=6″ x 20″ min. and max.
No. 25½R	56	4″ and 5½″	O=14″ x 18″ A=25″ x 34″	ST=3″; SH=7″ x 20″ min. and max.
No. 26R	65	4″ and 6″	O=16″ x 20″ A=28″ x 38″	ST=3″; SH=8″ x 20″ min. and max.

Famco Machine Co. — Kenosha, Wis.

Type and Model	Rating (Tons)	Crankshaft at Main Bearing and Pin	Standard Stroke	O=Opening in Bed A=Area of Bed	Shut Height
O.B.I. Presses Models No. 48 Bench No. 49 Bench No. 50 Floor	3	1¼″ x 2½″	1″	O=2¼″ Round A=5½″ x 9″	3⅜″
No. 50 Bench No. 50 Floor	4½	1½″ x 2½″	1¼″	O=3″ x 4″ A=6¼″ x 9″	5¼″
No. 51 Bench No. 51 Floor	7½	1½″ x 2⅞″	1¾″	O=3″ x 7″ A=7″ x 12″	6¾″
O.B.I. Deep Throat No. 50½ Bench No. 50½ Floor	5	1⅛″ x 2½″	1¾″	O=3″ x 3½″ A=6¼″ x 9″	6″
No. 52 Floor No. 53 Floor No. 54 Floor	8	1½″ x 2⅞″	1¾″	O=3″ x 7″ A=7″ x 12″	7″, 10″ and 13″
OB.I. Presses No. 56-J No. 56-E	13	1⅞″ x 2⅛″	1½″	O=4″ x 6″ A=9″ x 15″	7″
Electromatic	18	2¼″ x 2½″	2″	O=5″ x 7″ A=10″ x 16½″	7½″
Air Presses	Company makes a line of Air Presses ranging from 2″ max. stroke, 8″ shut height, 1770 p.s.i. to 4″ max. stroke, 12″ shut height, 7335 p.s.i.				

Rockford Iron Works — Chicago 43, Ill.

Type and Model	Rating (Tons)	Dia. Crankshaft at Main Bearing	O=Opening in Bed A=Area of Bed	ST=Stroke (Standard) SH=Shut Height
Inclinable No. 4-S	37	3" - 4⅛"	O=9" x 12" A=14" x 26"	ST=3"; SH=10¼"
No. 5-S	50	3½" - 5⅛"	O=10" x 14" A=18" x 32"	ST=4"; SH=11⅛"
No. 5½-S	56	4" - 5¼"	O=10" x 14" A=18" x 32"	do
No. 6-S	65	4" - 6"	O=14" x 16" A=21" x 34"	ST=4"; SH=13⅛"
No. 6½-S	71	4½" - 6"	do	do
No. 7-S	85	4½" - 6¾"	O=14" x 18" A=24" x 41"	ST=4"; SH=14"
No. 8-S	100	5" - 7½"	O=16" x 20" A=27" x 45"	ST=6"; SH=18"
Straight Side Tie Rod No. 505½	140	5½" - 8¼"	O=14" x 14" A=26" x 26"	ST=5"; SH=14½"

Dake Engine Company — Grand Haven, Mich.

Type and Model	Rating (Tons)	W=Widths Between Uprights R=Ram to Table, Dist.	Table Travel	Ram Travel
Elec-Draulic 50 HE	50	W=32¾"; R=40"	35"	4"
75 HE	75	W=44"; R=36"	32"	4½"
125 HE	125	W=48"; R=25"	20"	8"
Air-Hydraulic 25 PA and 25 PB	25	W=33½"; R=39"	35"	5"
50 PA, 50 PB, 50 PC, 50 PD	50	W=32¾"; R=40"	do	4"
75 PA, 75 PB, 75 PC, 75 PD	75	W=44"; R=36"	32"	4½"
125 PA, 125 PB, 125 PC, 125 PD	125	W=48"; R=25"	20"	8"
Hand-Hydraulic	Same specifications as for 25, 50, 75, 125 PA Series above.			

Company also makes line of Arbor Presses (1 ton to 3 ton); Single Leverage Presses (3 and 5 tons); Compound Leverage Presses (6, 12, 15, 25 tons); Utility Presses (10 tons); Custom Engineered Presses.

Movable Frame Presses Available Air or Electric				
19-220	25	W=33½"; R=35"	**Table Size** 30" x 60"	**Opening in Table** 6", 2"
19-221	50	W=32¾"; R=35"	30" x 72"	8", 4"
19-222	75	W=44"; R=36"	38" x 84"	10", 6"
19-223	125	W=48"; R=30"	42" x 96"	12", 8"
19-560	150	do R=36"	do	14", 10"

Dake Engine Co. — Grand Haven, Mich.

Type and Model	Rating (Tons)	Area of Table	ST=Stroke SH=Shut Height	Type and Model and Area of Table (Other specifications same as for Gap Type Straightening)
Gap Type Straightening				**Gap Type Forcing Presses**
25-246	15	8″ x 36″	ST=14″; SH=8″	28-301 15″ x 32″
25-247	25	10″ x 36″	do	28-302 15″ x 32″
25-248	35	12″ x 48″	do	28-303 17″ x 38″
25-250	50	do	ST=14″; SH=10″	28-304 17″ x 38″
25-252	75	12″ x 60″	do	28-305 18″ x 38″
25-254	100	18″ x 72″	ST=18″; SH=10″	28-306 25″ x 42″
25-256	125	22″ x 72″	do	28-307 31″ x 42″
25-258	150	24″ x 72″	ST=20″; SH=10″	28-308 33″ x 42″
25-260	200	24″ x 84″	ST=24″; SH=12″	28-309 34″ x 50″
25-262	250	do	do	28-310 34″ x 50″
25-264	300	do	do	28-311 34″ x 50″
Die Try-Out Presses with Cushion				**Die Try-Out Without Cushion**
18-600	25 pressing, and 10 pulling	24″ x 24″	ST=14″; SH=10″	18-612 SH=12¼″
18-601	50 pres., 18 pul.	30″ x 30″	do	18-613 SH=12¾″
18-602	75 pres., 28 pul.	36″ x 36″	do	18-614 SH=13½″
18-603	100 pres., 43 pul.	36″ x 42″	ST=20″; SH=10″	18-615 SH=14″
18-604	125 pres., 54 pul.	do	do	18-616 SH=14½″
18-605	150 pres., 65 pul.	38″ x 48″	do	18-617 SH=14¾″
18-606	200 pres., 78 pul.	45″ x 60″	ST=24″; SH=12″	18-618 SH=17½″
18-607	250 pres., 98 pul.	50″ x 60″	do	18-619 SH=18″
18-608	300 pres., 115 pul.	52″ x 60″	do	18-620 SH=18¾″

New Albany Machine Co. — New Albany, Ind.

Type and Model	Rating (Tons)	Dia. Crankshaft at Main Bearing	O=Opening in Bed A=Area of Bed	D=Dist. Bed to Slide S=Stroke (Standard)
O.B.I. Presses				
A 2	14	2″ x 2⅜″	O=4½″ x 8″ A=9″ x 14″	D=8″; S=1½″
A 2½	22	2½″ x 3″	O=6″ x 10″ A=13″ x 19″	D=8″; S=2″
A 3	32	3″ x 3½″	O=9″ x 12″ A=13″ x 22″	D=10″; S=2″
A 4	56	4″ x 4¾″	O=14″ x 16″ A=19″ x 29″	D=15″; S=3″
A 5	88	5″ x 6″	O=15″ x 20″ A=26″ x 39″	D=18″; S=3″

WHY IT PAYS TO BUY SPECIALTIES FROM US

You get quality products, fast delivery—*anywhere*

MAYBE you didn't know it, but U. S. Steel Supply can supply you with everything you need in the way of industrial supplies, as well as with the *steel* you need.

Call us for—Dardelet Rivet Bolts, High Strength Bolts, Blakled (a new rust-inhibiting material), grinding wheels, expanded metal, chain and chain slings, welding electrodes, welding machines, clamps, Markal Paintstiks, Galv-Weld (for regalvanizing welded areas), mechanical rubber goods – conveyor belts, transmission belts, all types of hose, V-Belts, structural fabricating machinery, sheet metal machinery.

These items are carried in stock ready for immediate delivery.

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LATHE CARRIAGE FLEXIBILITY

Nichols Miller

PRODUCTION MODEL

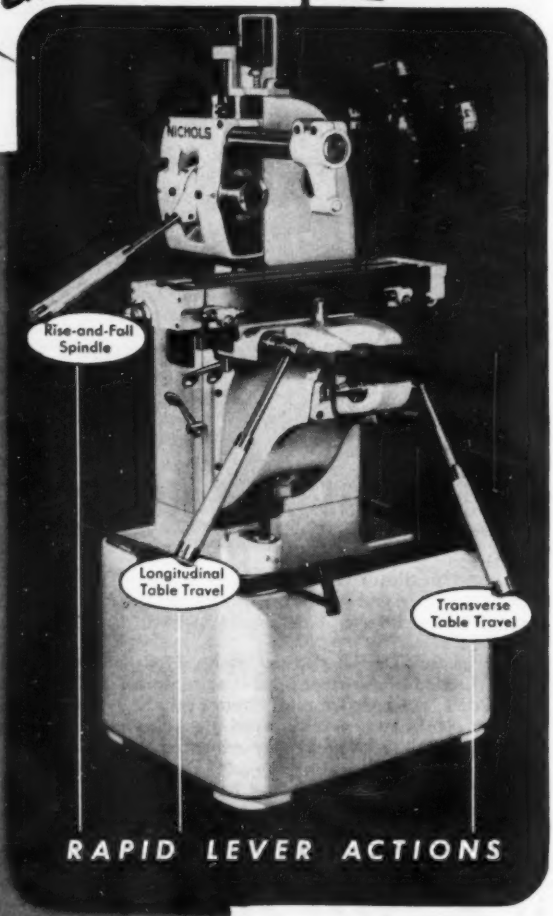
Precision turning, boring and recessing jobs that are normally assigned to toolmaker's lathes or expensive boring machines, come natural to the versatile NICHOLS Millers.

Rapid Lever Actions on the Spindle Head, Table, and Saddle provide unparalleled flexibility of movements. The Lever Transverse Feed, an exclusive NICHOLS development, is especially valuable. Makes NICHOLS different from other hand millers. It adds *"lathe-carriage flexibility"* to your most intricate machining operations, while maintaining tolerances to "tenths." Work can be chucked lathe-fashion on the spindle with tools mounted on the table or vice versa.

Adjustable positive stops, quick-acting locks on sliding movements, and the highest degree of precision are standard equipment.

"THE MILLER THAT USES ITS HEAD"

Send for free illustrated brochure.



RAPID LEVER ACTIONS

MANUFACTURED BY W. H. NICHOLS COMPANY, WALTHAM, MASSACHUSETTS

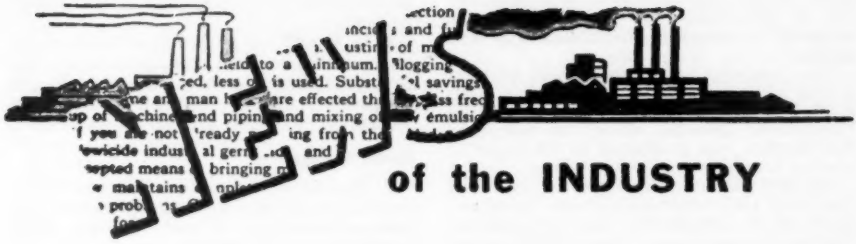
NATIONAL DISTRIBUTORS

NICHOLS-MORRIS CORPORATION

76-G MAMARONECK AVE., WHITE PLAINS, N. Y.

CONDENSED SPECIFICATIONS

Table Working Surface	6¾" x 21"
Longitudinal Table Travel	10"
Transverse Table Travel	7"
Vertical Travel of Knee	13"
Rise and Fall of Spindle	4½"
Selective Speed Ranges up to	5000 R.P.M.
Weight	1250 lbs.



Gisholt Announces Machine Tool Rental Plans

The Gisholt Machine Co., Madison, Wis., has announced three plans for the leasing of machine tools, each based on a seven-year lease agreement. Each may be written with or without the option to purchase. The right to terminate the agreement at the end of one, two or three years depends on the plan selected. The lease may also be written with the option to purchase at the end of any one of these same years.

The rental service is designed to cover standard machines, plus the required electrical equipment. Certain accessories and all tooling must be purchased outright. Special purpose machines can be leased by special arrangements. All plans are restricted to firms with well established credit references and limited to firms operating within the continental limits of the United States.

Machine tools built by the Gisholt Machine Co. include turret lathes, automatic lathes, automatic turret lathes, static and dynamic balancers, and superfinishing machines and attachments. Any of these machines may be leased under the new rental system.

Office and shop employees of the Brown & Sharpe Mfg. Co., Providence, R. I., view the lighted center unit of the company's A.S.T.E. Exposition booth. This unit, featuring micrometer calipers, was flanked by various items in Brown & Sharpe's line of industrial small tools.

Cincinnati Milling Machine announces new division, promotions

At a recent management group meeting of the Cincinnati Milling Machine Co., Frederick V. Geier, president, announced the formation of a machine tool division. This is the largest of the three broad divisions of the company: machine tools, process machinery, and products.

Swan E. Bergstrom, vice-president and director of the company, was named man-

E. D. Vancil

Swan E. Bergstrom

ager of the new machine tool division. He is responsible for all activities, including engineering, manufacturing, and selling.

The machine tool division will include a new special machine tool division, with **Carl Stugard**, formerly manager of the company's Chicago office, as manager. **Ed Rivoira** was promoted to manager of special machine tool engineering.

Al Dall becomes manager of standard machine tool engineering and development. **A. T. Blackburn** was promoted to works manager, and **Fred Miller** takes Blackburn's place as general superintendent.

E. D. Vancil has moved from manager of engineering to full management of the process machinery division, with **D. M. Strauchen**, former manager of this division, on extended service as consultant.

Name change

H. W. Twogood Co., Los Angeles, Calif., announces that its company name has been changed to Wheel Trueing Tool Company of California.

SEND FOR THIS FOLDER
And DATA SHEETS
Drillunit
the LONG STROKE unit
DRILLUNIT, INC.
OPERATES WITH 7 METHODS YOU KNOW AND TRUST
IT'S THE LONG STROKE UNIT!
12" stroke on base only 16⅜" long. Or smaller model, 9" on 13⅜" base. LONG STROKE makes it easy to change tools. TRAVERSE RATE over 400" min., FEED RATE up to 30" min. CAPACITY ½" in steel.
Self-contained, completely hydraulic. Unusually accurate and dependable. Especially adapted to use on transfer machines. For catalog-folder and data sheets, write DRILLUNIT, INC., 3273 Wight, Detroit 7, Mich.

Weld-a-Matic splicer to be made by Bliss

E. W. Bliss Co., Rolling Mill Div., Canton, Ohio, has recently acquired the manufacturing rights to the Weld-a-Matic splicer from the dissolved Arms-Franklin Corp. The agreement transfers to Bliss the patent rights, engineering drawings, service, operating and empirical data.

The splicer is used for ferrous and nonferrous strip, continuous feeding of skelp in light-walled pipe manufacture, reuniting silicon sheets into continuous strands and coils, following special processing, etc.

Disston eastern division men meet

Henry Disston & Sons, Inc., Philadelphia, Pa., recently held an important three-day sales meeting, including all of its eastern division men. Similar meetings are scheduled for the central and western division men.

All phases of the business were covered, including new and expanded sales and promotion plans and a new compensation program. The sales outlook for 1954 was optimistic.

It's the
WHOLE
Truth.....
Double eccentric type for irregular spacing
Universal joint with slip spindle fixed locating plate
Single eccentric type for equally spaced holes on bolt circles
US HEADS
Machine tool men "in the know" have long acclaimed the "US" Adjustable Multiple Spindle Drill Heads with their quick-change universal joint assemblies. They are built for continuous use, with full anti-friction bearing construction for high capacity thrust loads. The universal joint adjustable multiple spindle type is suitable for any sensitive drilling machine. Joints are self-lubricating.
The single eccentric type is used for equally spaced holes on bolt circles.
The new double eccentric AdjUStafix, two to eight spindles, permits spindles to be located in non-symmetrical patterns. It eliminates expensive change in set-up.
Write for details on any type of universal joint adjustable head. Ask also about our totally enclosed gear-driven adjustable, fixed center, or individual lead screw tapping heads.
UNITED STATES DRILL HEAD CO., 616-618 Burns St., Cincinnati 4, Ohio

New Detroit office for Scully-Jones

A new location at 19372 James Couzens Highway, Detroit 35, Mich., out of the congested area of the city, enables Scully-Jones sales and service engineers to contact customers and stocking distributors more quickly and more frequently.

The Detroit office serves seven Michigan distributors in addition to customers in St. Clair, Macomb, Oakland, Livingston, Wayne, Washtenaw, Calhoun and Monroe counties in Michigan, and the following counties in Ohio: Williams, Fulton, Lucas, Wood, Henry and Defiance.

Ace Abrasive Laboratories moves to its new building

Following upon the consistent growth of its "Star Dust" line which now includes a complete range of diamond wheels and diamond tools as well as diamond powders and diamond compounds, Ace Abrasive Laboratories now combines its operations in its own modern building at 35 Roselle St., Mineola, N. Y. Formerly in two New York City locations, the factory and executive offices are both expanded in the new quarters which contain about 10,000 square feet of floor space.

New office for Joseph A. Batlle Co.

Joseph A. Batlle Co. has moved from old quarters at 401 Broadway, N.Y.C., to a new air conditioned building at 47 Hillside Ave., Manhasset, N.Y.

STOP DUST

with **DUSTKOP**

Low cost, immediate control of dust from one remote dust source, or from a whole shop!

300 cfm to 10,000 cfm per unit (22 models) standard, pre-tested, available from stock. Ask for catalog 605-2. No obligation.

AGET-DETROIT CO.

205 MAIN ST. ANN ARBOR, MICH.

Special Taps

IN STOCK FOR IMMEDIATE SHIPMENT

HIGH SPEED RIGHT HAND TAPS

SIZE	THREAD
4	32-48-60-64
5	30-32-36-48-80
6	36-40-48-56-60
7	32-40-48
8	24-30-36-38-40-44-48
9	24-28-32-40-48
10	28-30-36-40-48-64
12	20-28-32-36-48
14	20-24-28
1/16	60-64
5/64	36-48-72
3/32	48-56-60
7/64	48-56-60
1/8	32-40
5/32	32-36-40-48
9/64	36-40-48
11/64	36
3/16	20-24-32
13/64	32-36-48
7/32	24-28-32
1/4	18-24-26-27-30-32-36-40-48
5/16	16-20-22-27-28-32-36-40
3/8	12-16-18-20-27-28-32-36-40-48
7/16	12-16-18-22-24-27-28-30-32-36-40
1/2	12-14-16-18-22-24-26-27-28-30-32-36-40
9/16	16-20-24-27-28-30-32-40-48
5/8	12-14-16-20-24-27-28-32-36-40
11/16	11-16-18-20-24-27-28-30-32
3/4	9-11-12-14-18-20-24-26-27-28-32
13/16	10-14-18-20-27-32
7/8	10-12-16-18-20-24-27-28-32
15/16	8-9-10-12-14-16-18-20-24-32
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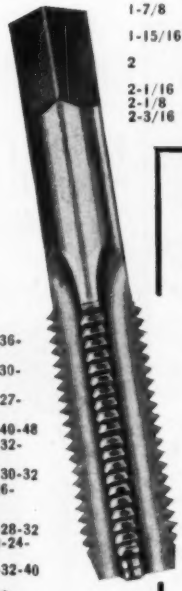
1-3/16	8-10-12-14-16-18-20-24
1-1/4	8-10-14-16-18-20-24-32
1-5/16	12-14-16-18-20-24-32
1-3/8	8-10-14-16-18-20-24
1-7/16	8-10-12-16-18-20-24
1-1/2	8-10-14-16-18-20-24-28
1-9/16	18-20-24-36
1-5/8	5½-8-10-12-13-16-18-20-24
1-11/16	10-12-14-16-18-20-24



SIZE	THREAD
1-3/4	8-10-12-14-16-18-20-24
1-13/16	8-10-12-14-16-18-20
1-7/8	8-10-12-14-16-18-20-24
1-15/16	8-10-12-14-16-18-20-24-28
2	4½-8-10-12-16-18-20
2-1/16	12-14
2-1/8	12-16-20
2-3/16	12-16

SIZE	THREAD
2-1/4	4½-8-12-14-16-18
2-5/16	12-18
2-3/8	12-16-18
2-1/2	8-18-12
2-9/16	18
2-5/8	12-16-20
2-3/4	16
2-7/8	8-12-16
3	8-16
3-1/4	8-12-16
3-1/2	8-12-16
3-7/8	6
4	8-12

HIGH SPEED LEFT HAND TAPS

SIZE	THREAD
0	80
1	56-64-72
2	56-64
3	56
4	32-36-40-48
5	40-44
6	32-36-40
8	32-36-40
10	24-30-32-40
12	24-28-32
1/4	20-28-32
5/16	18-20-24-28-32
3/8	16-24-32
7/16	14-20-28
1/2	12-13-20-23
9/16	12-18-20-24
5/8	11-12-18-20-24

SIZE	THREAD
11/16	11-16-24
3/4	10-16-18-20
13/16	16
7/8	9-12-14-18-20
1	8-12-14-16-18-20
1-1/8	7-12
1-1/4	7-12-16-18
1-3/8	6-8-10-12-16-18-20-24
1-7/16	8-10-12-14-16-18-20
1-1/2	6-8-10-12-16-18-20
1-9/16	8-10-12-16-18-20
1-5/8	8-10-12-14-16-18-20
1-11/16	8-10-12-14-16-18-20
1-3/4	8-10-12-14-16-18-20
1-13/16	8-10-12-14-16-18-20
1-7/8	8-10-12-14-16-18-20
1-15/16	8-10-12-14-16-18-20
2	4½-10-12

LEFT HAND AND SPECIAL DIES IN STOCK

PRICES ON APPLICATION
NEW SIZES ADDED FREQUENTLY

NOTE: Oversize taps. Special size reamers. H. S. extension drills. H.S. Taper length drills No. 1 to No. 60—Letter sizes A. to Z. Fractional sizes 1/8" to 1/2" 12" Overall 9" flute length. H.S.S.S. aircraft drills 6" and 12" long.

We Specialize In High Speed Cutting Tools

SPECIAL PRICES TO DEALERS

WESTERN TOOL SUPPLY COMPANY

617-19 W. Randolph St., Chicago 6, Ill. PHONE: RAndolph 6-4113

MONTHLY BULLETINS AVAILABLE

Thor buys Speedway

Thor Power Tool Co., Aurora, Ill., has purchased the Speedway Mfg. Co., Chicago. The merger unites Thor's manufacture of portable electric tools in the industrial, mining, construction and automotive fields with the lower priced craft-type tools of Speedway.

The newly acquired company will continue with the same personnel at the Chicago plant, and under the same executive management, including **Wm. B. Scace,** Speedway president, and **Jack R. DeBacher,** vice-president. The plant will operate as the Speedway Mfg. Div. of the Thor Power Tool Co. The entire Speedway line will be marketed as "Thor SpeedTools."

Diamond builds new plant

Construction is almost completed on the new factory and general offices of the Diamond Machine Tool Co., at Pico, Calif. The buildings will have over 55,000 square feet of manufacturing area exclusive of the general offices for the fabrication of milling machines, punch presses, shears,

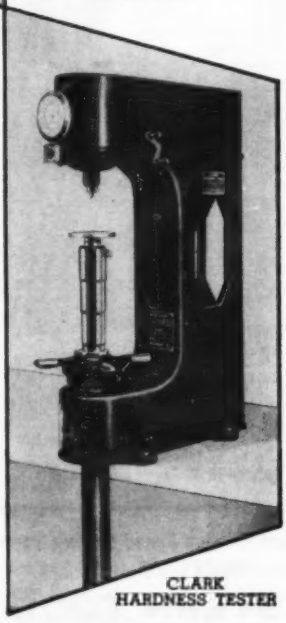
CLARK

THE MOST FOR YOUR "ROCKWELL TESTING" DOLLAR!

The Clark Hardness Tester is precision built to give guaranteed precision results. Thousands of Clarks, with years of service all over the world, attest to this.

The surprisingly low price includes the precision Clark Diamond Cone Penetrator, as well as Steel Ball Penetrators, a wide assortment of Anvils, Test Blocks, and other accessories. Available in two models, for Standard and Superficial "Rockwell" hardness testing, each with choice of 8", 12", or 16" work capacity.

Before you invest in any hardness tester, get the facts about the low price, speedy delivery, and *guaranteed accuracy* of the Clark. Write today.



CLARK HARDNESS TESTER

CLARK INSTRUMENT, INC. 10206 FORD ROAD DEARBORN, MICH., U.S.A.

lathes, horn presses, OBI presses, radial drills and boring mills.

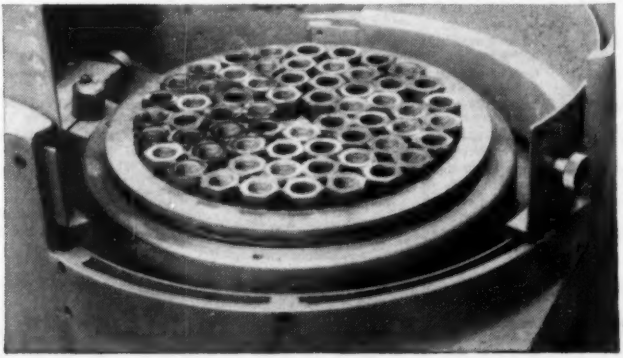
There are three wings to the main building for machining, parts, and assembly, and these are connected to welding and storage buildings by 10-ton bridge cranes.

Ex-Cell-O Corp. Limited to operate plant in England

At the annual meeting of shareholders of Ex-Cell-O Corp., held recently, H. G. Bixby, president, announced that the corporation had formed a new, wholly owned subsidiary, Ex-Cell-O Corp. (Machine Tools) Ltd., to be located in England.

The new subsidiary acquired all of the assets, including land, buildings, machinery, equipment and inventory, of Alfred Bray & Sons, Ltd., of Leicester, England.

It is intended that the English subsidiary will begin to manufacture some of the machine tool lines now being produced by Ex-Cell-O in the United States. **E. J. Townsend** has been appointed managing director of the English firm.



ONE . . . TWO . . . THREE . . . FOUR

1. Another interesting holding problem solved by WALKER.
2. Your holding problem too can be solved by WALKER engineers.
3. Each WALKER solution means efficiency . . . effectiveness . . . economy.
4. Over sixty years of WALKER know-how is no farther away than your telephone—Worcester 6-6293.

Hold Everything with Walker Chucks

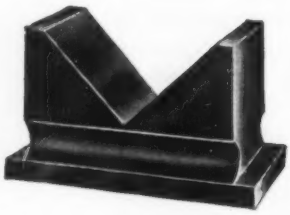
O. S. WALKER CO. Inc.
WORCESTER 6, MASSACHUSETTS
Original Designers and Builders of Magnetic Chucks

Appointments and Promotions

Name	Company	To	Position
Raymond W. Hermanson	Tubing Appliance Co. Los Angeles, Calif.	Merit Mfg. Co. Culver City, Calif.	Director of Sales and Advertising
Dr. Alexander Blakely	Vesuvius Crucible Co. Pittsburgh, Pa.	Metal Removal Co. Chicago, Ill.	Vice-President in charge of Mfg.
William Descault	Morse Twist Drill & Mach. New Bedford, Mass.	Same	Works Manager
H. G. Trotter	Morse Twist Drill & Mach. New Bedford, Mass.	Same	Assistant to Exec. Vice-President
Frederick E. Munschauer, Jr.	Niagara Mach. & Tool Wks. Buffalo, N.Y.	Same	Vice-President in charge of Mfg. and Industrial Relations
Frank J. Coughlin	Niles-Bement-Pond Co. West Hartford, Conn.	Same	Director of Purchases
John M. Cook	Behr-Manning Corp., a Norton Co. subsid. Troy, N.Y.	Norton Company Worcester, Mass.	Director
Terence A. Cordner	Behr-Manning Corp., a Norton Co. subsid.	Same	Controller
Edwin C. Evans	Behr-Manning Corp., a Norton Co. subsid.	Same	Vice-President
Bruno D. Hendrickson	Norton Company Worcester, Mass.	Same	Abrasive Engineer in charge of Western New York
Milton P. Higgins	Norton Company Worcester, Mass.	Same	President of the Board
Leon E. Hoogstoel	Behr-Manning Corp., a Norton Co. subsid.	Same	Vice-President
Wallace L. Howe	Norton Company Worcester, Mass.	Same	Vice-President in charge of Research and Development
George N. Jeppson	Norton Company Worcester, Mass.	Same	Chairman of the Board

SEMI-PRECISION "V" BLOCKS

for all-around shop use



Sturdily designed for hard usage . . . Accurately machined from close-grain iron . . . Ideal for drill presses, milling machines, shapers and planers. Will test round shafting for straightness . . . Economically priced.

Write for descriptive bulletin.

STOCK NO.	BASE	HEIGHT	THICK-NESS	ACROSS TOP	CAP.	WT.	NET PRICE EA.
10	4½" x 3"	2⅝"	3"	3½"	3½" dia.	6½ lbs.	$ 7.50
11	6½" x 4"	4"	4"	5½"	6" dia.	18 lbs.	$15.00

ACME TOOL COMPANY

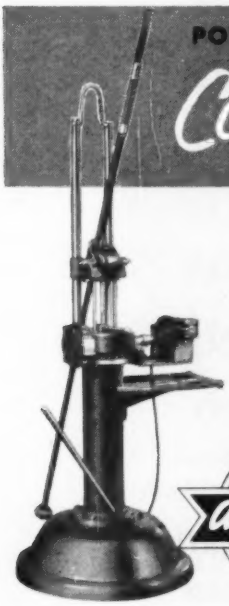
71 WEST BROADWAY **NEW YORK 7, N. Y.**

Name	Company	To	Position
Donald L. Price	Norton Company Worcester, Mass.	Same	Sales Manager, Abrasive Div.
Albert L. Breuer	Onsrud Machine Works, Inc. Chicago, Ill.	Same	Sales Manager
George M. Campbell	Onsrud Machine Works, Inc. Chicago, Ill.	Same	Vice-President and Secretary
Ray C. Reinhartsen	Onsrud Machine Works, Inc. Chicago, Ill.	Same	Executive Vice-President and General Manager
Eugene J. LaPorte	Reed Roller Bit Co., Cleco Div. Houston, Texas	Chicago branch	Assistant Sales Div. Manager
J. T. Roberts	Reed Roller Bit Co., Cleco Div. Kansas City, Mo.	Chicago branch	Salesman
Robert W. O'Neal	Follansbee Steel Corp. Pittsburgh, Pa.	Rees Mchy. Co., Inc. Pittsburgh, Pa.	Sales Engineer
Maurice M. Clemons	General Motors Corp., Cleve. Pressed Metal Div. Cleveland, Ohio	Sahlin Engrg. Co. Birmingham, Mich.	Chief Engineer
Garvin A. Drew	A. Schrader's Son Div., Scovill Mfg. Co., Inc. Brooklyn, N.Y.	Same	Vice-President in charge of Sales, Service, Advertising and Sales Promotion
Francis J. Kinsella	Standard Pressed Steel Co. Jenkintown, Pa.	Same	Manager of Outside Sales
Albert B. Ross	Life Casualty Insurance Co. Nashville, Tenn.	Henry G. Thompson and Son Co. New Haven, Conn.	Assistant Rep., Southeastern Territory
Howard Roberts	Truare Div., Waldes Kohinoor, Inc. Long Island City, N.Y.	Same	Technical and Sales Rep.
Gustav C. Schroeder	Truare Div., Waldes Kohinoor, Inc. Long Island City, N.Y.	Same	Supervisor of Production Planning
James E. Compton	All Metals Industries, Inc. Latrobe, Pa.	Wesson Co. Detroit, Mich.	Field Engineer, Pittsburgh area
W. B. Duncan	Wesson Co. Detroit, Mich.	Same	Chairman, Board of Directors
E. Mortensen	Wesson Co.	Same	President

POWER SCRAPER

Cuts Production Costs...

. . . 5 HOUR JOB CUT TO 50 MINUTES



One manufacturer was scraping flat pieces measuring 18 by 24 inches . . . each piece requiring 5 hours to scrape by hand. An Anderson Power Scraper cut scraping time to 50 minutes! That meant a substantial saving in production costs and another happy Anderson customer. Let us help you estimate how much this portable, easy-to-use power scraper will save for you.

Today, Write for Bulletin 7-5

Anderson

ANDERSON BROS. MFG. CO., Rockford, Ill.

A. H. d'Arcambal

Alexander H. d'Arcambal was elected president of Niles-Bement-Pond Co., West Hartford, Conn., at the organizational meeting of the board of directors held recently. He had been acting general manager since the sudden death of **Frederick U. Conard** on March 14, 1954. **Charles W. Deeds,** former president of the company from 1943 to 1947, was elected chairman of the board of directors. **Richard W. Banfield** was named to the newly created position of executive vice-president. All the other officers were re-elected. At the annual meeting of the

Richard W. Banfield

Brady Pumps

Designed and Built

We welcome your pump problems and inquiries. Brady specializes in the design and manufacture of small Centrifugal Pumps . . . used as original equipment by leading manufacturers in Air Conditioning, Refrigeration, Dairy, Machine Tool and many other Industries.

for your Specific job

Write, phone or wire

Brady CORPORATION

1007 East 18th Street Muncie, Ind.

Charles W. Deeds

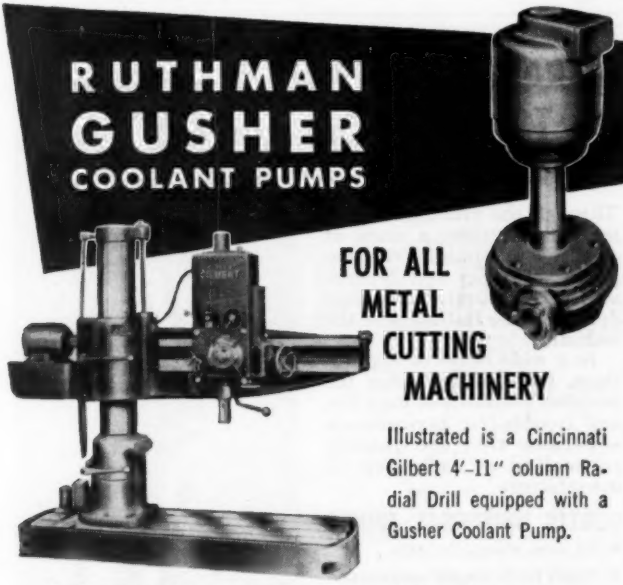
stockholders held in Flemington, N.J., the vacancy on the board of directors created by Mr. Conard's death was filled by the election of **Sidney A. Stewart** to the board. Stewart was recently made a vice-president and manager of the Chandler-Evans Div. of the company.

The appointment of **George Doig** as sales manager of Numatics Operating Valves, Milford, Mich., was recently announced by William Carls, owner.

The Skinner Chuck Co. and Skinner Valve Div., New Britain, Conn., have an-

George Doig

RUTHMAN
GUSHER
COOLANT PUMPS



FOR ALL METAL CUTTING MACHINERY

Illustrated is a Cincinnati Gilbert 4'-11" column Radial Drill equipped with a Gusher Coolant Pump.

Ruthman Gusher Coolant Pumps are better three ways

1. Gusher Coolant Pumps give you split-second coolant flow when the machine is turned on.
2. Pre-lubricated heavy-duty ball-bearings, totally enclosed drip proof motor, elimination of packing and priming, cut maintenance to a minimum.
3. Electronically balanced rotating assembly with no metal to metal contact assures long life.

Always Specify Gusher Coolant Pumps

THE RUTHMAN MACHINERY CO.

1816 READING ROAD CINCINNATI, OHIO

nounced the election of **Arthur E. Thornton**, president, as chairman of the board of directors. **Paul K. Rogers, Jr.**, vice-president, succeeds Thornton as president of the company. Rogers was also re-elected treasurer. **Sherrod E. Skinner** was elected a director of the company to fill the vacancy left by his father, **E. J. Skinner**, former chairman of the board, who died in 1953. **Robert D. Twohig** was appointed assistant secretary and controller of the company. **James N. Skinner** was re-elected vice-president and director, and **Kenneth H. Walther**, sales manager of the chuck division, was re-elected secretary and director.

George S. Chiaramonte, sales manager of Horton Chuck, announces the appointment of **Roger W. King**, Meriden, Conn., as manufacturers' representative for Horton in upper New York state and eastern Canada.

The Sterling Abrasives Div. of The Cleveland Quarries Co., Tiffin, Ohio, has announced the appointment of **James L. Goodwin** as Cleveland district manager, with offices at 2333 St. Clair Ave.

TRADE MARK TO HALLMARK

Through the years, our trade mark has become a mark of quality that stands for the simplicity, efficiency and dependability of Curtis Universal Joints . . . the Hallmark of the industry.

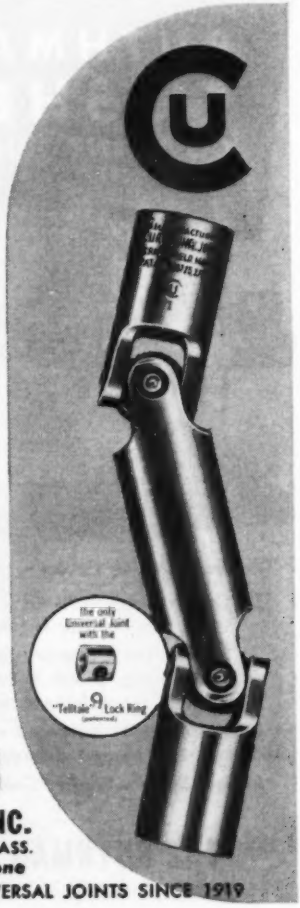
In a wide range of applications, Curtis Joints offer the designer assurance of long life, and trouble-free performance — because they are quality-controlled at each step of manufacture.

CURTIS UNIVERSAL JOINTS

- 14 sizes always in stock
- Fewer parts, simpler construction
- Complete equipment for government tests

Our catalog torque and load ratings are substantiated by constant tests. You can depend on them.

Not sold through distributors. Write direct for free engineering data and price list.



CURTIS
Trade Mark
UNIVERSAL JOINT CO., INC.
18 BIRNIE AVE., SPRINGFIELD, MASS.
As near to you as your telephone
A MANUFACTURER OF UNIVERSAL JOINTS SINCE 1919

R. N. Oysler

Clemson Bros., Inc., Middletown, N.Y., has announced the appointment of **Harold W. Nelson** and **Hugh B. Jackson** as divisional sales managers. Nelson will supervise sales in North and South Dakota, Minnesota, Wisconsin, Illinois, and part of Iowa, with headquarters in Rochester, Minn. Jackson will supervise sales in the states of Iowa, Nebraska, Kansas and Missouri, with headquarters in Mission, Kans. The company also has announced the retirement of **R. N. "Neal" Oysler**. Oysler has represented Clemson Bros. in the Missouri River Valley area for the past 35 years.

Harold W. Nelson

DE•STA•CO HELPS PUT SKYLIGHT IN THIS CAR

Photos courtesy Ford Motor Company, Detroit Macoid Company.

Eleven Model 210 TU De•Sta•Co Toggle

Clamps position and hold hot plastic sheets during the vacuum molding process used to produce transparent car roofs for Ford and Mercury automobiles. This fixture requires positive holding pressures during the 10 minute draw of Plexiglass sheet heated to 300° F. Two-second engagement and release of the De•Sta•Co Toggle Clamps speeds production, assures accuracy.

De•Sta•Co Toggle Clamps are available in over 45 models, with positive holding pressures up to 4000 pounds, for any work holding application.

Write for free catalog today.

DE•STA•CO DETROIT STAMPING CO.

347 MIDLAND AVE. • DETROIT 3, MICH.

Harold E. Martin

Harold E. Martin was named division superintendent of a newly created metal cutting tool division of the Brown & Sharpe Mfg. Co., Providence, R.I.

The Gairing Tool Co., Detroit, Mich., announces the election of **B. O'Meara** to the office of executive vice-president. **Wm. B. McClellan** has been appointed sales manager. Other officers, comprising **O. I. Boekle,** treasurer; **D. G. Hawksworth,** vice-president; **Julius Pochelon,** secretary, were re-elected. **Miss D. O'Neil** was appointed assistant secretary.

Hugh B. Jackson

SIGOURNEY

M-100

THE PRECISION BENCH DRILLING MACHINE

ACCURATE because table and column exactly squared one to the other.

LONG LIFE because of hardened and ground spindles.

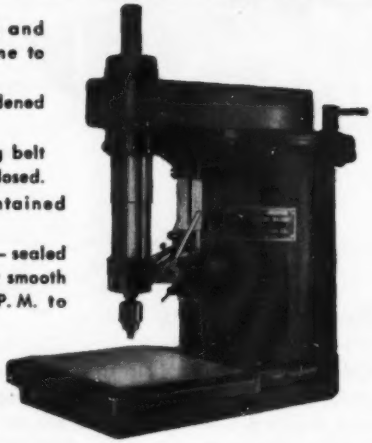
SAFE because motor, driving belt and spindles are entirely enclosed.

STRONG, RIGID for maintained accuracy.

SMOOTH AT HIGH SPEEDS — sealed ball bearings throughout for smooth operation from 4000 R. P. M. to 10,000 R. P. M.

MODELS — with 1, 2, 3 and 4 spindles.

Send for illustrated bulletin.



THE SIGOURNEY TOOL CO.

Hartford 6, Conn.

Sole Sales Agent

PRATT & WHITNEY

Division Niles - Bement - Pond Co. West Hartford, Connecticut

18GB2

Joseph P. Villo

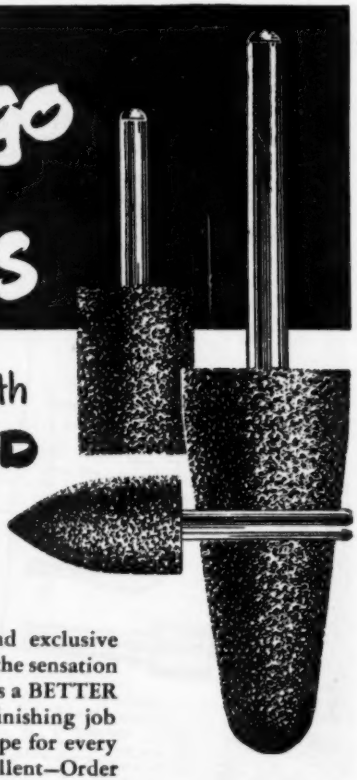
The Standard Pressed Steel Co., Jenkintown, Pa., has moved **Joseph P. Villo** and **Frederick D. Fernsler**, two of the firm's management team, into top division sales posts. Villo, formerly superintendent of form and finish, was appointed division manager of aircraft and allied products. Fernsler, who was manager of production control, was made manager of the Unbrako-Flexloc div.

R. S. Koroncai has been appointed vice-president and general manager of the industrial diamond division of Grof Mfg. Co., Cleveland.

F. D. Fernsler

Chicago
MOUNTED
Wheels

...now
even better with
79E BOND



Buy Chicago Mounted Wheels—bonded with 79E Bond—and you'll never use any other!

79E—a tough new bond exclusive with Chicago Wheel—is the sensation of the industry . . . it does a BETTER grinding, burring, and finishing job FASTER. A size and shape for every use. Deliveries are excellent—Order today.

CHICAGO WHEEL & *Mfg. Co.*
Dept. MT • 1101 West Monroe Street, Chicago 7

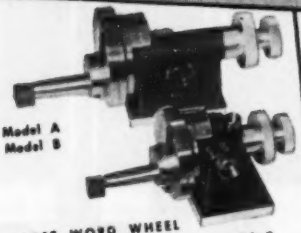
C. A. Thomas, Jr.

Standard Pressed Steel Co., Jenkintown, Pa., has moved up **Edwin Y. Bready, Charles A. Thomas, Jr.,** and **James L. MacDowell** in the ranks of top management. Formerly director of purchases, Bready has been made division manager of the Hallowell Pressed Steel Div. Thomas, manager of industrial relations and industrial engineering, has been given company-wide charge of production control, quality control, estimating and cost analysis, in addition to his previous responsibility for industrial relations and time study.

MacDowell has been advanced from

Edwin Y. Bready

Improve Your Operating Efficiency, Quality and Profits with these LAST WORD Metal-Working Products!



Model A
Model B
Model C

LAST WORD WHEEL DRESSERS FOR RADIUS AND TANGENT ANGLE DRESSING — AVAILABLE IN 3 MODELS
MODEL A—For grinders using wheels up to 20" dia. **MODEL B**—For small model surface grinders with 7" max. wheel dia **MODEL C**—Compound Dresser, will compensate for compound angles involved in grinding form tools.

SAMSON "Heavy-Duty" OFFSET BORING CHUCK—Has positive centering feature for drilling and milling operations. Complete accessories available

GRAY-GRIMES FLOATING DRIVER—For reaming, tapping, valve seating and similar operations. Can be supplied with standard or special shanks and adaptors.

GRAY-GRIMES AUTOMATIC STEADY-REST FOR O. D. GRINDING—Permits grinding complete length of shaft maintaining constant pressure against work piece as stock is removed.

Mfg'd by Gray-Grimes Tool Co.

Send for complete data

LAST WORD sales company
18500 MT ELLIOTT Dept A • DETROIT 34, MICH

James L. MacDowell

manager of tooling and quality to superintendent of manufacturing, fastener div. The assignments were made in an organization realignment under which the company's three divisions—pressed steel, Unbrako-Flexloc and aircraft—are given greater autonomy and their top men a higher degree of responsibility.

Cincinnati Lathe & Tool Co. officials have announced the promotion of **John D. Humphreys** to assistant chief engineer. He has been a member of the engineering department.

John D. Humphreys

World's Hardest Metal
TOOLS
BLADES
ROLLS
BAR STOCK
DIES
Many times more durable than steel, Talide Metal adds years of life to the wearing edges of tools, dies, machinery and equipment.
Hard as a diamond and almost indestructible, it triples output per man and per machine.
For good service and recommendations for improving any cutting, drawing or wear-resistant application, send particulars to Metal Carbides Corp., Youngstown 7, Ohio. Write for Catalog No. 54-G
METAL CARBIDES CORPORATION
MC
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SINTERED CARBIDES - HOT PRESSED CARBIDES
HEAVY METAL - CERMETS - HIGH TEMPERATURE ALLOYS
OVER 23 YEARS' EXPERIENCE IN TUNGSTEN CARBIDE METALLURGY

The following changes have recently become effective at the Morton Mfg. Co., Muskegon Heights, Mich.:

Robert E. Morton, vice-president and general manager of the welding div; **James H. Morton,** vice-president and assistant manager of the welding div; **Jack E. Morton,** assistant secretary and purchasing agent; **Thomas H. Morton,** assistant treasurer and manager of the machine key div.; **Oren G. Rutemiller,** manager sales and engineering; **Sherwood Basch,** acting chief engineer; **Kenneth Oslund,** chief engineer, welding div.; **Harold Larsen,** production manager, welding div.; **W. M. Hovey,** co-ordinator of records and procedures.

Kennametal Inc., Latrobe, Pa., has announced appointments of sales representatives as follows: **Warren Eisenberg** in the St. Louis district, **Raymond Guenther** in the southern district, and **Robert Welch** in the New England district.

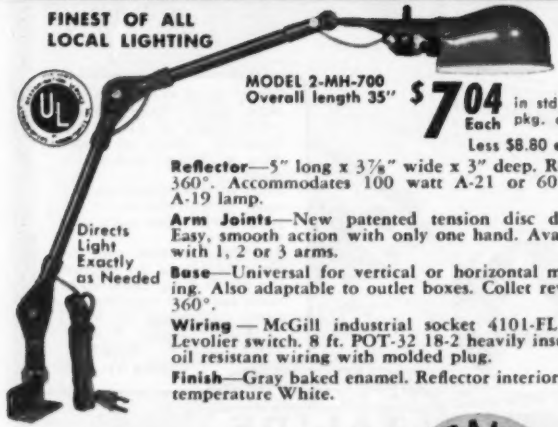
M & N Hydraulic Press Co. announces the appointment of **Kenneth Y. Ryan** as general sales manager at their Clifton, N.J., plant.

NEW 1954 MODELS

LIGHT AS YOU WANT IT
for Machine Tools, Assembly and Inspection Benches

FOSTORIA LOCALITES

FINEST OF ALL LOCAL LIGHTING



MODEL 2-MH-700
Overall length 35" $7.04 Each in std. pkg. of 8
Less $8.80 ea.

Reflector—5" long x 3⅞" wide x 3" deep. Rotates 360°. Accommodates 100 watt A-21 or 60 watt A-19 lamp.

Arm Joints—New patented tension disc design. Easy, smooth action with only one hand. Available with 1, 2 or 3 arms.

Base—Universal for vertical or horizontal mounting. Also adaptable to outlet boxes. Collet revolves 360°.

Wiring — McGill industrial socket 4101-FL with Levolier switch. 8 ft. POT-32 18-2 heavily insulated oil resistant wiring with molded plug.

Finish—Gray baked enamel. Reflector interior, high temperature White.

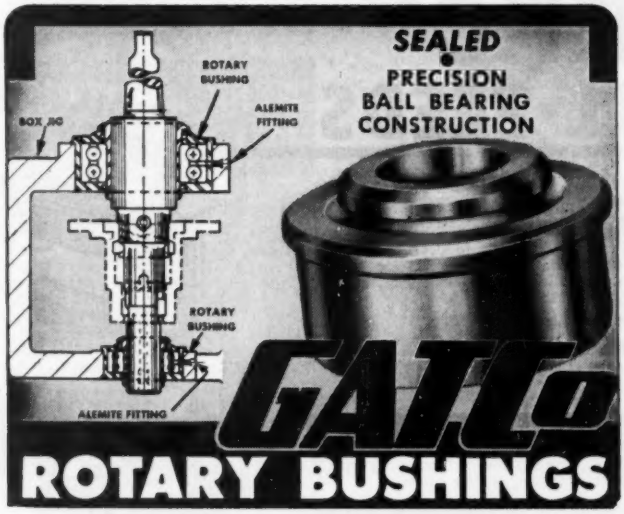
WRITE for complete catalog of Localite models for every industrial use.

THE FOSTORIA PRESSED STEEL CORPORATION
Fostoria, Ohio
Localites available through wholesalers everywhere

LOCALITE fostoria for Light ON the Job

Cincinnati Milling and Grinding Machines, Inc., sales subsidiary of The Cincinnati Milling Machine Co., Cincinnati, Ohio, announces a new domestic selling organization. **Carl M. Beach** continues as vice-president and domestic sales manager. Serving on his staff are **Jack Lynch**, former manager of the company's New York office and now manager of standard milling machine sales, and **Kent Mathias**, formerly assistant to the sales manager and now manager of standard grinding machine sales. **Phil Hewett**, former manager of engineering service, has been assigned to the special machine tool div. as manager of special machine tool sales. **Ken Martin**, a member of Cincinnati's machinery div., is now sales manager of that division.

Anton Smit & Co., Inc., 333 W. 52nd St., New York 19, N.Y., recently announced changes in the corporation: **Daniel S. de Rimini**, Gen. S.M.; Board of Directors—**Mrs. Leonard Smit**, Chmn. (president); **Frans L. Meyjes**, V.P.; **Jan Bakker**, V.P.; **Chas. C. Stalter**, Legal Advs'r; **Alwyn A. Springmeyer**.



FOR DRILLING, CORE DRILLING, ROUGH AND FINISHED BORING

The inner race of the GATCO bushing rotates with the tool, piloting the tool accurately below or above the work—or both.

Eliminates expensive tool construction—Reduces tool wear—Prevents seizure and pilot breakage—Especially adapted where precision is required.

Write for full information and prices

GATCO ROTARY BUSHING CO.

42330 ANN ARBOR ROAD, U.S. 12, PLYMOUTH, MICH.
Telephone PLYMOUTH 1472

Wm. F. Wilson

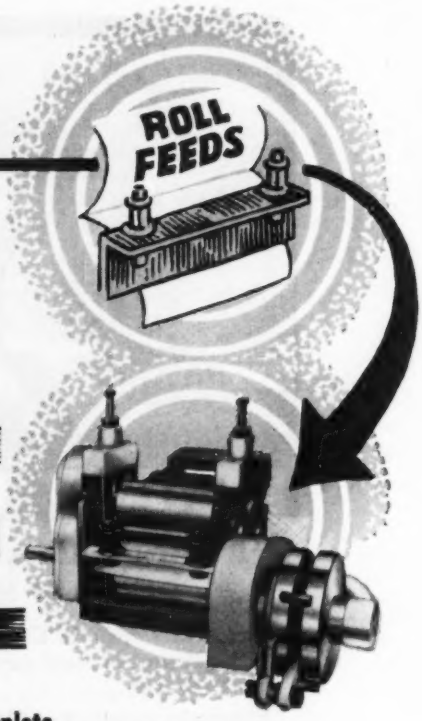
The Gear Grinding Machine Co., Detroit, Mich., announces the appointment of **William F. Wilson** to the position of works manager. Wilson will be in charge of all manufacturing operations in the company's joint, gear, and machine tool divisions.

Sidney Andrews has been named vice-president in charge of research and development for the Metal Removal Co. of Chicago.

The Ingersoll Milling Machine Co., Rockford, Ill., has appointed three new

Sidney Andrews

"RFC" ROLL-FEEDS



FITS ANY PRESS

For side or rear feeding. All attachments for installing furnished, including disc and connecting linkage.

CAN'T SLIP

Each wedge has four points of contact to safeguard accuracy.

REVERSES INSTANTLY

Merely shift feed finger spring from one lug to the other.

FEEDS IN THOUSANDTHS

Amazingly accurate stock movement assured.

MAINTAINS ORIGINAL SETTING

Regardless of use or wear. No ratchets or pawls to wear down and "Throw off" feed spacing.

Ready for mounting! Furnished complete.

Write today for latest Bulletin.

EARLY DELIVERY ON STANDARD MODELS

Roll-Feeds Corporation

Tel. Pawtucket 2-2200 PAWTUCKET, RHODE ISLAND

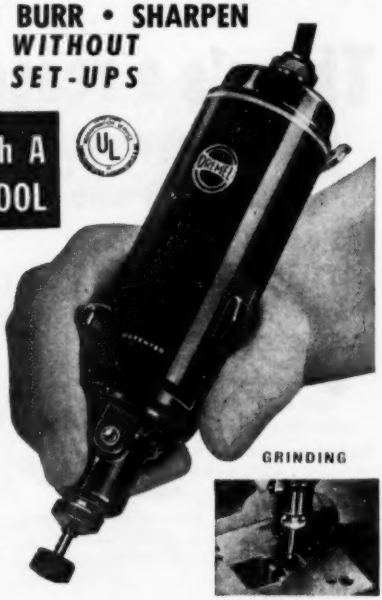
men to its staff of sales representatives and revised a number of territorial assignments, as follows: **Walter J. Mason,** Indiana and western Ohio; **Robert H. Harris,** Philadelphia and New York metropolitan areas; **Donald G. Brophy,** eastern Ohio and western Pennsylvania; **D. L. S. McCoy,** Detroit area; **Ralph W. Jensen,** central Michigan.

New Plastic Corp., Los Angeles, Calif., has announced changes in executive personnel. **J. Allen Carmien,** formerly executive vice-president, recently assumed the presidency of the company. **W. C. Fortier,** previously acting in the capacity of treasurer, is now vice-president and treasurer. **John W. Schmidt** has been appointed sales manager of the tool division. Carmien has acquired controlling stock interests and will direct the policy of the company. **Fred S. Jahn** resigned as president and director.

The appointment of **Jerold L. Welch** as assistant chief engineer of Reed-Prentice Corp., Worcester, Mass., has been announced.

POLISH • GRIND • BURR • SHARPEN
IN SECONDS . . . WITHOUT TEARING DOWN SET-UPS

Do It Faster With A DREMEL MOTO-TOOL

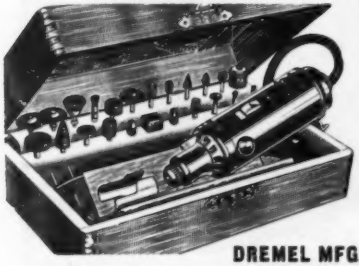


Dremel Moto-Tools are used in many different types of industries by thousands of diemakers, machinists and hobby craftsmen for polishing and grinding dies, burring parts, sharpening cutters, etc. A money-maker and time-saver, the Moto-Tool does close works in seconds without tearing down costly production set-ups.

APPROXIMATELY 27,000 R.P.M.

MOTO-TOOL NO. 2, with one emery wheel point **$17.85**

MOTO-TOOL KIT NO. 2, with 23 accessories (high speed steel cutters) and Model 2 Moto-Tool in sturdy steel case **$25.95**



GRINDING

SHARPENING

BURRING

See Your Nearby Industrial Distributor or write for Catalog.

DREMEL MFG. CO., Dept. 214-G Racine, Wis.

Glenn D. Easton

Glenn D. Easton has been appointed chief engineer for Lovejoy Tool Co., Inc., Springfield, Vt. Easton succeeds **E. B. Lucarini,** who is retiring.

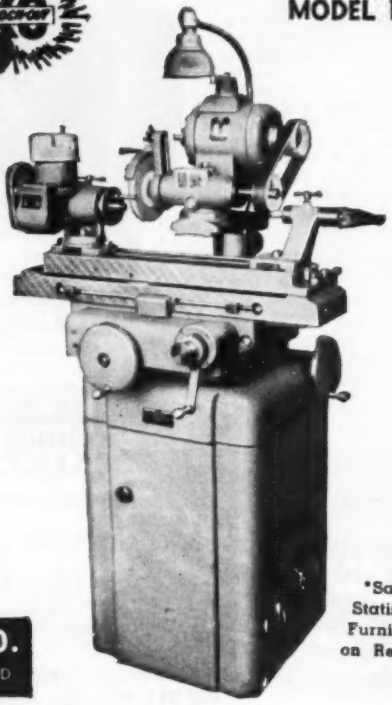
The Lincoln Electric Co. of Cleveland has added three men to its field staff of application engineers for servicing industrial users of arc welding. **Jack Jaso** has been assigned to the Chicago district. **Walter Rockway** is serving in the Cin-

Albert Patnik

There's a reason 71%*

of all popularly-priced Tool and Cutter Grinders sold in 1953 were "Knock-Outs"

MODEL B860



Will do anything that machines costing 2 or 3 times more will do . . . yes and in less time.

Distributed Only Through Franchise Dealers

K. O. LEE CO.
ABERDEEN S D

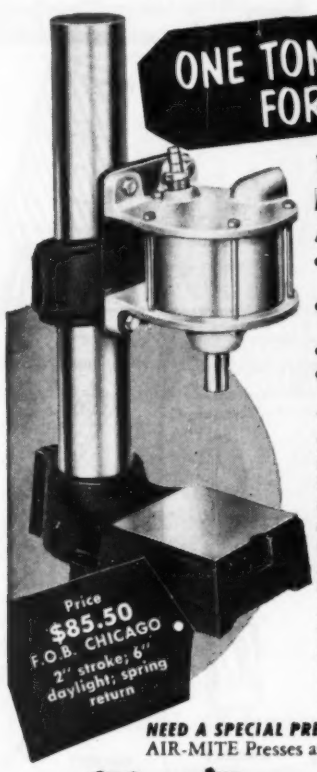
*Sales Statistics Furnished on Request

cinnati district. **Chester Shira** has been assigned to the Jacksonville, Fla., district.

Also announced is the appointment of **Albert Patnik** to the newly created position of dealer sales manager.

The Cosa Corp., New York, N. Y., has expanded its sales staff. Six sales engineers have been appointed to East Coast territories: **Leroy Osborn**, Connecticut, **James McDonough**, Long Island; **Charles Burke**, N.Y.C. and Westchester; **William Buhl**, northern New Jersey; **Albert Schlumpf**, southern N.J. and Phila.; **O. A. Linse**, Del., Md., Va., and Washington, D.C. Coverage has been increased in New England by the recent appointment of two dealers: Hicks Machine, Inc., Walpole, N.H., to handle sales in Maine, N.H., Vt., R.I. and eastern Mass., and Dr. Walter Riesenfeld for western Mass.

William Gormley was recently appointed to represent the industrial sales division of Henry Disston & Sons, Inc., Philadelphia, Pa., in Ohio. His territory consists of a 14-county area in the northeastern part of the state.



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- **Accurately ground 5" x 5" table**
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You get more for your money when you choose AIR-MITE—more press, more utility and more production. Built by air press specialists to meet the demand for a low cost unit that could stand the gaff of high production work, AIR-MITE presses will show you quality, efficiency and economy you never thought possible at their price. Made in ¼, ½, ¾ and 1 ton capacities with spring or air return.

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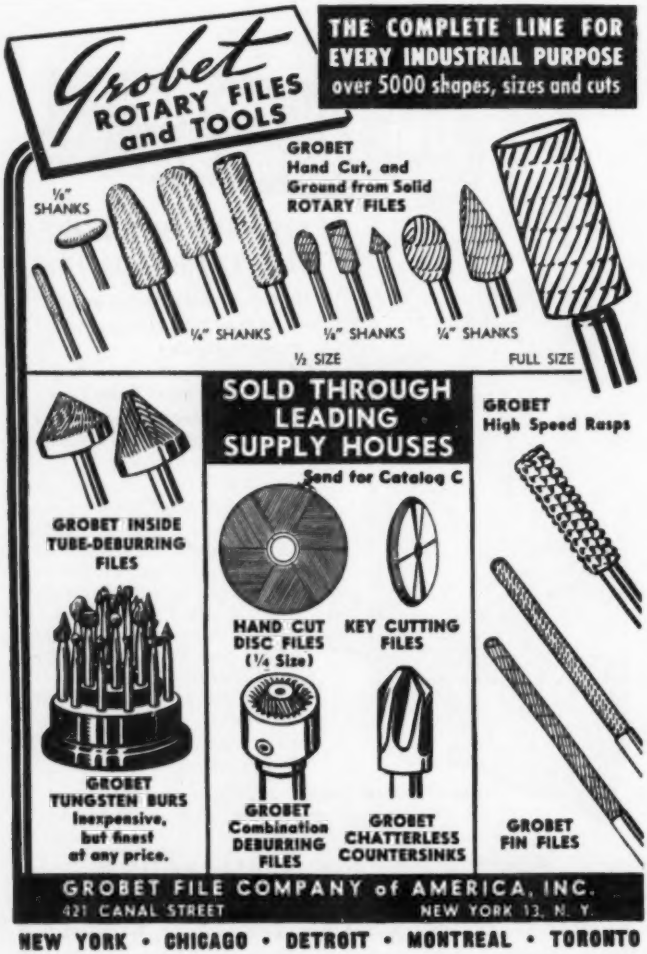
F. Jerome Tone, Jr., was made senior vice-president and **Frederick T. Keeler** was appointed director of sales for the Carborundum Co., Niagara Falls, N.Y., according to an announcement by General Clinton F. Robinson, president of the company.

The Metal Carbides Corp., Youngstown, Ohio, has announced the appointment of **Sam Ernst** as a sales engineer with the Chicago office; **Joseph R. Weiss, Jr.**, as a sales engineer with the Cincinnati office; and **William Hudak**, as a sales engineer with the Newark, N.J., office.

R. J. Reif has been appointed advertising manager of The R. K. LeBlond Machine Tool Co., Cincinnati, O., it has been announced by B. N. Brockman, vice-president.

J. H. Beardsley was elected executive vice-president at the annual directors' meeting of the Bryant Chucking Grinder Co., Springfield, Vt. **R. W. Bowlen** was recently elected a director. **H. A. Bush** was made clerk of the corporation.

M.B.I. Export & Import, Ltd., Bronx, N.Y., has announced the re-election of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W. J. Neureither, chief engineer, as vice-president, and the promotion of **D. Gladstone** to comptroller and **F. Hollander** to secretary.

Clover Mfg. Co., Norwalk, Conn., has announced the appointment of **Walter R. Trezise** as sales manager.

At a meeting of the board of directors of Ex-Cell-O Corporation, Detroit, recently, **Edward J. Giblin** was appointed to the position of assistant secretary.

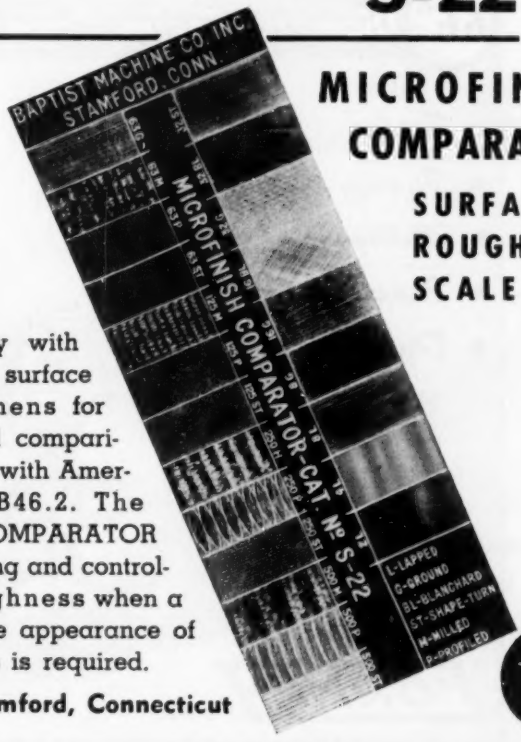
The Hanson-Whitney Div. of Whitney Chain Co., Hartford, Conn., has announced the appointment of Macaulay Machinery Co., Inc., Rochester, N.Y., as exclusive sales representative in the northern New York territory. The Fisgus Machinery Co., Buffalo, N.Y., has been appointed to represent Hanson-Whitney in the western New York territory.

Lichtenberger Brothers of Chicago have been named distributors for Cleco Air Tools. Offices are at 2715 W. Lake Street.

THE *New* S-22

MICROFINISH COMPARATOR

SURFACE ROUGHNESS SCALE



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$15.00 F.O.B. Stamford, Connecticut

BAPTIST MACHINE CO.
STAMFORD, CONN.

Firth Sterling Inc., Pittsburgh, has appointed four new distributors of its steel and carbide products. Denman & Davis, N. Bergen, N.J., is the exclusive distributor in the New York metropolitan area. O'Neal Steel Co., Birmingham, Ala., now distributes steels in the states of Georgia, Alabama, Mississippi, Arkansas, northern Florida, northern Louisiana and eastern Tennessee. The Mau-Sherwood Supply Co., Cleveland, Ohio, and Standard-Shannon Supply Co., Philadelphia, Pa., are distributors in the Cleveland and Philadelphia areas respectively.

Joseph T. Ryerson & Son, Inc., steel service organization, is now distributing plastic pipe and fittings produced by the Carlon Products Corp., Cleveland, Ohio. Service on these products is available through the sixteen Ryerson steel service plants located in major industrial areas across the country.

The National Acme Co. of Cleveland, Ohio, have announced their appointment as exclusive sales representatives in the United States for English-built B. S. A. single spindle automatic screw machines.

Adamas Carbide Corp., Kenilworth, N.J., has announced the appointment of the Nelson R. Church Co., Pawtucket, R.I., as its sales representative for the states of Massachusetts, Rhode Island, Maine, New Hampshire and Vermont. Adamas also has announced the appointment of Allied Carbide Products, Willow Grove, Pa., as its sales representative for eastern Pennsylvania, southern New Jersey and Delaware.

Rahn Granite Surface Plate Co. has announced the appointment of Sterling Sales, Inc., 787 Main St., Worcester 3, Mass., as its sole distributor in New England for its line of black granite (diabase) surface plates, angle plates, parallels and straight edges.

B. C. Ames Co. of Waltham, Mass., has announced the appointment of J. B. Morrison Machinery Co., Ltd., Toronto, as exclusive Canadian representative.

Cerro de Pasco Corp., New York City, has announced the appointment of the Die Supply Co., Detroit, Mich., as dis-

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PARTS FEEDERS

. . . provide automatic, controlled feeding at lower costs

Handle small parts of nearly any shape or material in oriented position—single file—without damage. Instantly controllable feeding rate insures steady flow of parts at required production speeds. Electromagnetic—no mechanical wearing parts—ideal for use in automation set-ups.

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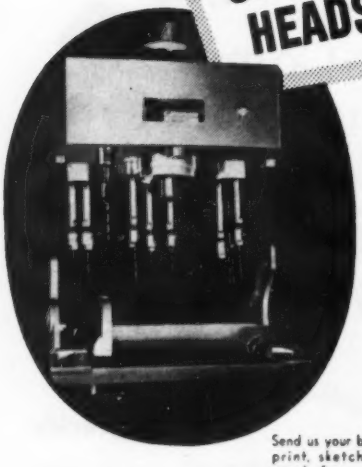
300 Lexington Ave. Homer City, Pa.

D-O-W-N
Come Drilling Costs...

ERRINGTON *Multiple* **SPINDLE HEADS**



Send us your blueprint, sketch or sample for a quotation.

Shown is a 10 Spindle Multiple Drilling Head, drilling ten varied size holes on different elevations. The head has grooved thrust ball bearings at all thrust points and hardened bronze radial bearings. Heat treated spindles and gears of one piece turned from solid bar stock. It is geared approximately 2:1. All enclosed in a sand-cast aluminum case and cover, with alemite pressure lubrication.

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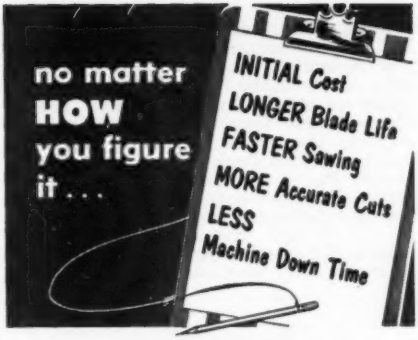
ERRINGTON Mechanical Laboratory, Inc.
Established 1891
Main Office and Plant: **STATEN ISLAND 4, NEW YORK**



MILFORD Blades mean LOWER PRODUCTION COSTS

Only with tools *known to "deliver"*, can you increase production and cut production costs. MILFORD REZISTOR Metal-Cutting Saw Blades "deliver" faster, more accurate cutting, plus longer work life because *no finer blades are made anywhere.* And, they cost you no more than ordinary blades.

Let us show you how MILFORD Blades can contribute by an actual demonstration in your own plant on your toughest job.

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☐ *Please send a copy of the new MILFORD Metal Cutting Catalog.*
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tributor for Cerro alloys in Michigan, northeastern Indiana and Lucas County, Ohio.

Appointment of **Glenn C. Lechleitner** as general manager of the Cleveland Punch & Shear Works Co., Cleveland, has been announced. Lechleitner previously held the posts of sales engineer and sales manager.

Boice-Crane Co., Toledo, Ohio, has announced the addition of western New York, western Pennsylvania, and West Virginia to territory now being covered by the Herren-Sims Co., Cleveland, Ohio, Boice-Crane representatives.

Lester F. Nenninger, 1895-1954

Lester F. Nenninger, assistant manager of the machine tool division of The Cincinnati Milling Machine Co. and vice-president of the company's sales subsidiary, Cincinnati Milling and Grinding Machines, Inc., died recently at the age of 59.

Mr. Nenninger spent his entire business career in the machine tool industry. He came to The Cincinnati Milling Machine Co. in 1912. Starting as a tool and fixture designer, he advanced to machine tool designer, assistant in charge of machine tool design, and in 1926 he was appointed chief engineer. In 1943, he was made works manager, and in January 1954, was appointed to the position he held at the time of his death.

Don't forget to mention MACHINE and TOOL BLUE BOOK when writing advertisers, or use the handy Readers' Service card on page 64.

HIGHER SPEEDS!
FASTER GRINDING!

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AIR GRINDERS

MODEL JA
50,000 R.P.M.
$42.00
IN U.S.A.

Weight 12 ounces; length 6¾ inches; chuck size ⅛ inch. Wheel guard removed for better illustration.

The RPM's stay up while grinding . . . not only when the grinder runs idle. That means better work—longer wheel life.

High speed grinding with small wheels was a Madison-Kipp development of the late twenties. It was born out of a pressing need in our tool room. Because tool room grinding problems are universal, we believe it will pay you to utilize Kipp grinders in your tool room as generally as we do in our own.

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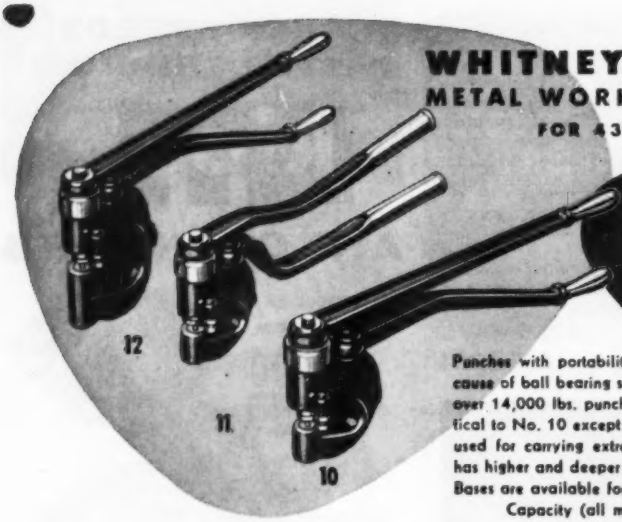
MADISON-KIPP CORP.
207 Waubesa St., Madison 10, Wis., U.S.A.



WHITNEY-JENSEN
METAL WORKING TOOLS
FOR 43 YEARS

NOS. 10-11-12 BALL BEARING PUNCHES

Punches with portability and power combined. Because of ball bearing screw principle, each develops over 14,000 lbs. punching pressure. No. 11 is identical to No. 10 except for tubular handles which are used for carrying extra punches and dies. No. 12 has higher and deeper throat for punching channels. Bases are available for fixed-position punching.

Capacity (all models) ⅜" through ¼"

WHITNEY METAL TOOL COMPANY • 115 FORBES STREET, ROCKFORD, ILLINOIS

BLUE VALLEY FLANGING MACHINES

No. 1 10 gauge capacity combination circle shear and flanger; from 14" to 6' diameter flat with support; 12' diameter less support.

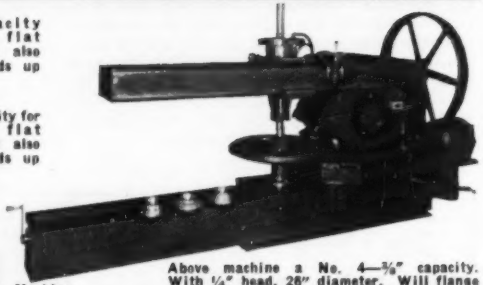
No. 3 ¼" capacity flanging flat heads from 18" to 12'.

No. 4 ⅜" capacity flanging flat heads 20" to 12'; also handles standard dished heads up to 12' dia.

No. 5 ½" capacity flanging flat heads 24" to 20'; also handles dished heads up to 12' dia.

No. 6 ¾" capacity for flanging flat heads 28" to 20'; also handles dished heads up to 12' dia.

No. 53 Elliptical Head Shear and Flanging Machine which operates from the same controls. Head is sheared to size and shape before flanging from same template without removing work from the machine.



Above machine a No. 4—⅜" capacity. With ¼" head, 28" diameter. Will flange flat heads from 20" to 12 ft. in all thicknesses up to and including ⅜" boiler plate. Dished head attachments can be furnished with this model.

BLUE VALLEY MACHINE & MFG. CO.
6832 Truman Road KANSAS CITY 3, MO.

Frederick U. Conard dies

The death of **Frederick U. Conard**, president and general manager of the Pratt & Whitney and Chandler-Evans divisions of Niles-Bement-Pond Co., West Hartford, Conn., and president of the Potter & Johnston Co., subsidiary, Pawtucket, R.I., has been announced. He was elected president of the company in 1947 after having served for 28 years in various executive capacities with Underwood-Elliot-Fisher Co.

Death takes Ransom Soper

Ransom Soper, 57, Long Island sales representative of Rudel Machinery Co., Inc., died in Garden City, N.Y., recently. Mr. Soper had been associated with the machine tool industry since 1915 and joined Rudel in 1948.

"We Consider
DY-NAMIC BALANCING
absolutely necessary for
HIGH SPEED Rotating Parts"
says G. Selig, vice-president and plant manager of Remsel Industries, Chicago, Illinois, where this "Bear" Dy-Namic Balancing Machine is used to balance impellers.
The need for Dy-Namically Balancing every rotating part—especially those that spin at high speeds—is being recognized in every phase of industry. Select the "Bear" Machine that fits your budget and your operation from the..
free DY-NAMIC BALANCING MANUAL!
Tells how you can easily, quickly, economically balance rotors, armatures, crankshafts, and any other part that turns, weighing from 4 oz. to 8 tons! See how to reduce wear, eliminate noise and vibration, improve all-around performance of finished product. Your copy sent without cost or obligation. Bear Mfg. Co., Dept M-20 Rock Island, Ill.
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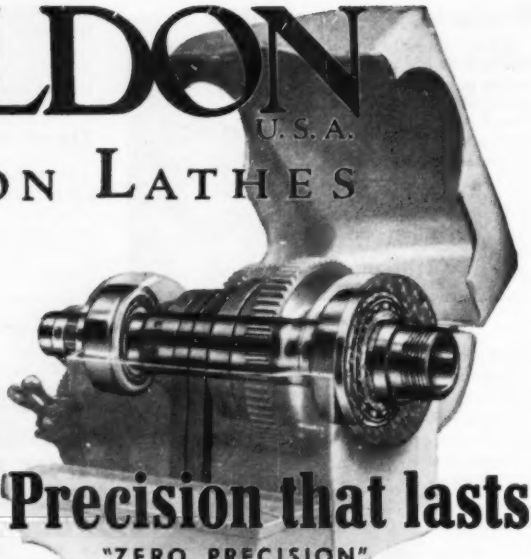
"BEAR"
STATIC AND DY-NAMIC BALANCING MACHINES
balance rotating parts weighing from 4 oz. to 8 tons

SHELDON

CHICAGO U. S. A.

PRECISION LATHES



Precision that lasts

. . . "ZERO PRECISION"
TAPER ROLLER BEARINGS

No lathe can be more accurate than its spindle bearings. Hence before buying any lathe one should check the exact type and tolerances of bearings used!

All SHELDON Precision Lathes have "Zero Precision" Taper Roller Bearings, held to tolerances of .00015"—more accurate than the bearings found in most lathes. They are also the sturdy type that hold their accuracy thru long, hard use . . . hold it even under abuse. With the other stamina features built into SHELDON Precision Lathes, they assure continued accuracy, without costly maintenance, thru years of hard service.

SHELDON
"Stamina" Features:

- Rigid, Heavily cross strutted 1-piece Beds—2 V-ways, 2 Flat ways
- Full Double-Walled Aprons—all gear shafts supported on both ends.
- Heavy Carriage with wide bearing on bed.
- Twin V-Belts to Spindle for extra power.

Write for Catalog

SHELDON MACHINE CO., INC.
4242 N. Knox Ave., Chicago 41, Illinois

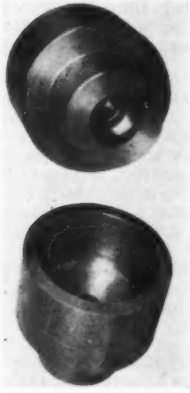
What's New IN METALWORKING

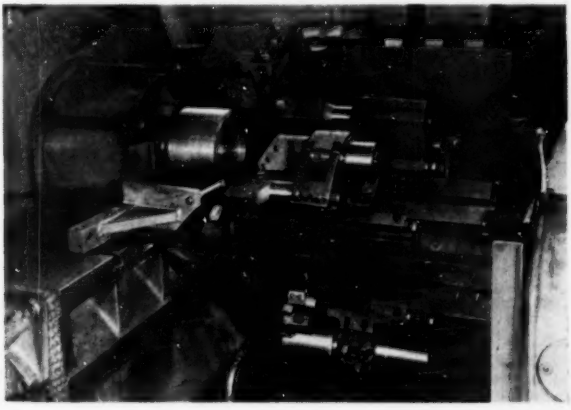
Predetermined Cycle Time for All Machining Operations in a Setup Speeds Production of Acme 12" Single Spindle Chucking Automatic

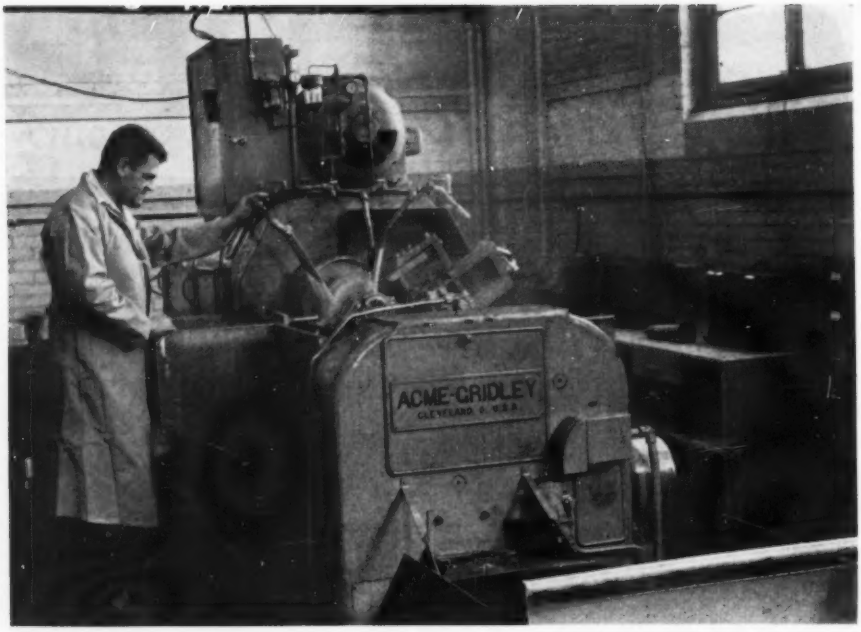
PROVEN UP TO FIVE TIMES FASTER IN FLOOR TO FLOOR time, because of its predetermined cycle time for all machining operations in a setup, National Acme's newest chucker now brings turret lathe work into the scheme of automation, through completely automatic control.

There is no time loss from the start of the machining sequence after loading

Tooling for first operation setup on 12" Model MC Acme-Gridley single spindle chucker machining hydraulic cylinder head from 7¾" steel casting; these hydraulic cylinder bodies are used in operating the chucks for each spindle on the automatics. First operation work on the large end of the steel casting includes 10 machining cuts which are performed in the automatically controlled cycle on the Model MC in floor to floor time of 10.7 minutes. Previous methods required 23.3 minutes. Second operation work on other end of piece required 14 cuts (including a four-step reamer for finishing four diameters in the small hole in the end). New time is 8.9 minutes compared with 30 minutes by former methods.







Operator directs coolant nozzle on cutting tools following loading of 7¾" steel casting hydraulic cylinder body being machined on 12" Universal Model MC Acme-Gridley single spindle automatic chucker. All ten machining operations of the first operation setup (on one end) of the cylinder body will be performed without operator intervention during the automatically controlled machining cycle before the machine stops for unloading of the workpiece.

until the finished piece is unloaded. With its open tooling zone and easily accessible chucking area, there is plenty of room for automatic loading equipment to adapt this machine to an "automation line."

Wider speed and feed ranges with speed changes automatically controlled during the machine cycle give greater versatility in combining carbide and high speed tooling as well as threading in the same automatic setup. Each of the five turret toolslides and two cross slides is independently cammed. Idle time movements such as advancing toolslides to cutting position, returning them after completion of cut to turret indexing position, and indexing of the turret slides, are all accelerated. With these features, more machining operations are incorporated into an automatically controlled cycle and the total machining time per piece for all operations in the setup is predetermined in accordance with tolerances and finish required.

The 12" Universal Model MC is easy to tool up. The tooling zone is without interference from shafts or accessories—operator has free access to tools at elbow height. Cams for the toolslides are readily accessible, and the timing control switches are grouped for operation from cam dogs mounted on a single drum at the rear of the machine. This design for quick change-over from job to job makes this air-operated chucker economical and practicable for small lot setups as well as long production runs.

Adaptability for additional tooling, including specialized attachments for self-

opening threading dies and collapsible taps, permits more operations to be included in a single automatic setup, thus avoiding rehandling the piece.

Designed to meet present day demands for versatility with speed and strength to use carbide and high speed tools with high precision, this chucker is built for heavy duty performance. Other features include: Husky basic frame structure; heavy toolslides without overhang; fast and shockless turret indexing; modern safety devices protecting both machine and operator. The National Acme Co., Dept. B, 170 E. 131st St., Cleveland 8, Ohio.

Use ACTION Card, opposite page 64. Encircle No. 1

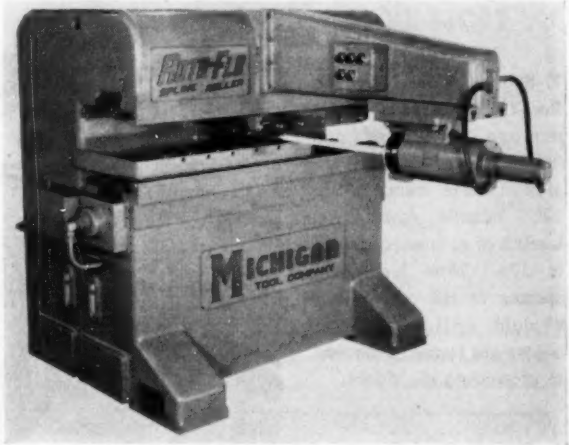
New Spline Rolling Machine Slashes Time From 4 Minutes to 10 Seconds on One Job

A NEW spline rolling machine rolling an axle shaft spline has drastically reduced floor-to-floor time. Splined shafts of 1⅛" diameter and 1¼" length were formed in three seconds. The return stroke, with machine empty, took two seconds. Automatic handling of parts will take less than four seconds. Complete cycle for many parts is less than 10 seconds. The above parts were rolled from SAE 1037 ranging in hardness from annealed to 41 Rockwell "C" scale. The finish obtained was 3 to 6 microinches. The accuracy was within .0008" variation from part to part over pins. For this installation, see figures 1 and 2.

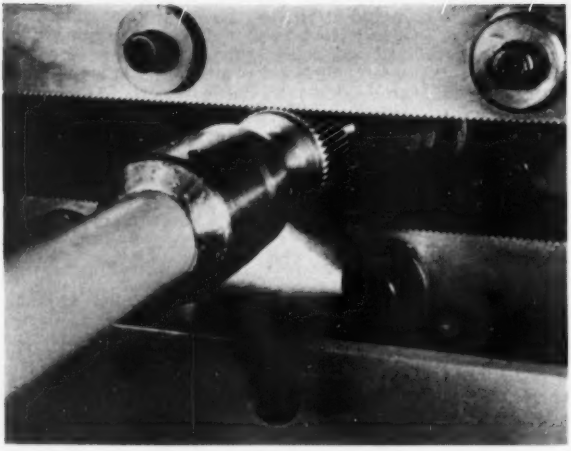
This basic new process for producing splines, oil grooves, serrations and other similar shapes on external parts is announced by the Michigan Tool Co., 7171 E. McNichols Road, Detroit 12, Mich. Known as Roto-Flo spline rollers, these machines will be available in three sizes.

Rolling splines or similar shapes on Roto-Flo machines is a cold working process in which the metal shaft is placed between the forming racks and emerges in a few seconds with the teeth completely formed at any desired position along the shaft. The resulting splines have a high degree of accuracy along with excellent surface finish. Since the metal is displaced and not removed, parts are usually made to the pitch diameter before forming. Early tests indicate that parts produced with rolled splines will withstand higher torsion loads for equivalent shaft sizes than the parts with splines hobbed or shaped from the same material. This increased load capacity will allow designers to take advantage of finer splines for doing the same jobs now being done by coarser splines.

Other design advantages will become apparent as a user becomes acquainted with the Roto-Flo forming process. This design flexibility has already made quite an impression. One outstanding design



1. Roto-Flo spline roller rolling experimental axle shaft splines. For demonstration and test purposes an adapter has been fitted on the end of the forged shaft. This eliminates the use of completed forged shafts for test purposes. This particular machine will be adapted to automatic loading and unloading when it is placed in the customer's plant.



2. This is a close-up of the racks and rolling operation as performed on the part shown in figure 1. As mentioned, an adapter is used on the end of the shaft. Splined shafts are 1 1/8" in diameter and 1¼" in length, and are rolled in 10 seconds. Finish is 3 to 6 microinches. Steel is SAE 1037, ranging in hardness from annealed to 41 Rockwell on the "C" scale.

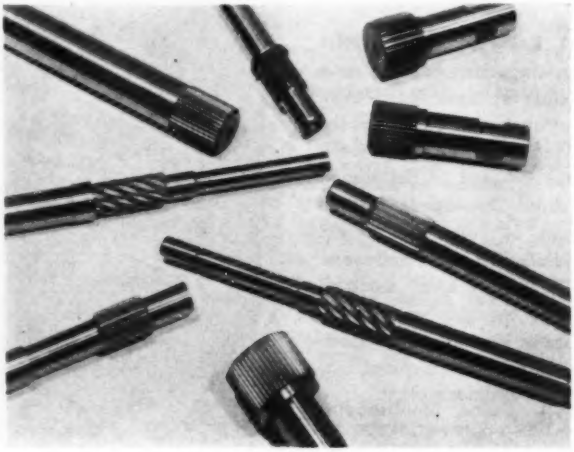
example is that teeth have been formed all the way up to a protruding shoulder diameter. Since a recess for tool clearance adjacent to the shoulder is not required with the Roto-Flo method, and the shoulder is not damaged in any way, greater strength and better bearing surfaces are obtained.

Photomicrographs of polished sections cut through the teeth demonstrate the actual flow of the metal to conform with the contour at the root of the teeth. It is evident that with this type of grain structure higher tooth strength will be obtained.

The basic components of the Roto-Flo machine, besides the rack-type forming tools, are two slides and extremely heavy "C" shaped machine frame.

The two slides, holding the forming racks, are mounted one above the other. The slides are geared together with master racks, (not the tool racks) and a connecting gear. The lower rack is the prime mover and gains its power from hydraulic cylinders.

Tool racks are adjustable toward the part center to obtain proper size, and



3. Splines formed by the Roto-Flo process in an average of 3½ seconds forming time. The splined shafts range from ⅞" to 1⅝" outside diameter. Length of splines range up to 1¾". Note helical splines at left center and straight splines at top center are formed adjacent to protruding shoulders.

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UNIVERSAL CUTTER AND TOOL GRINDERS

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It's true, they have been hard to get because every model offers extra value.

The Model 62, for instance, features four-speed spindle drive, universal positioning of elevating hand wheel, anti-friction ways, more vertical capacity, longer swing, one-shot lubrication system.

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405 Straight Ave., Grand Rapids, Mich.
Please send me the following literature.

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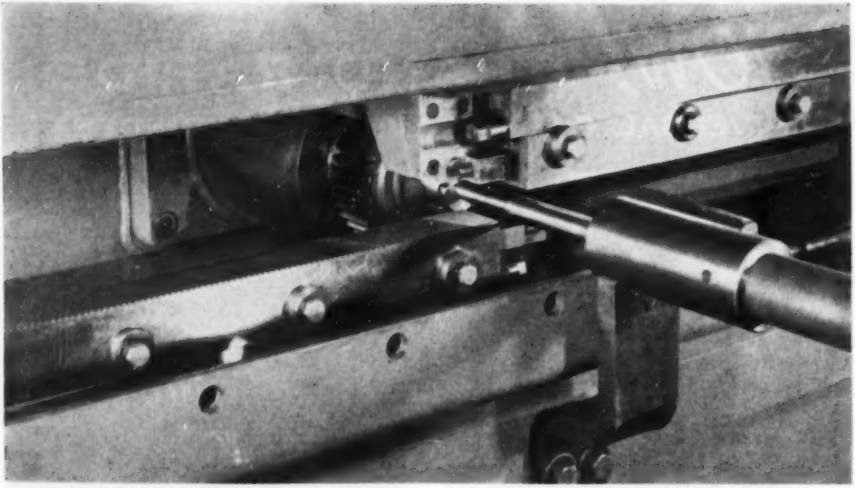
FIRM ADDRESS _____

We'll answer within twenty-four hours



4. Forming racks of the spline roller are about to engage the O.D. of a shaft. This particular spline has a helical form. Note the fine starting serrations at the beginning of the lower rack. These starting teeth at the beginning of both racks grip the shaft and start it rolling between the rack forming teeth.

Continental

CHASER AND CUT-OFF WHEEL GRINDER

Keeps tools sharp

One machine does both—it sharpens pipe thread chasers at one end—and pipe and tube cut-off wheels at the other end. Keeps your tools ready for instant use—always sharp. *Also, Manufacturers of Cut-Off Machines and Wheels.*

Request Circular, Today.

Continental MACHINE CO.
SINCE 1919
1952 N. MAUD AVE. • CHICAGO 14, ILL.

are also adjustable endwise to gain correct relationship with the part axis.

Parts to be formed are positioned between the forming racks. They are supported between centers or by other suitable methods, so that the shaft is rotated by the movement of the forming racks.

High tool life is to be expected from the forming racks, since all stresses are compressive and not in shear as with cutting tools.

The racks are designed to press deeper and deeper into the parts as they roll together until full depth is reached, and then a few additional turns are made at full depth. Racks have been made of high-carbon, high-chrome steel. Rack teeth are ground on a special Michigan Tool machine designed to give extreme accuracy in spacing, pressure angle, helix angle, etc.

An automatic coolant system is provided for cooling the forming racks and splines under mass production conditions.

Roto-Flo machines are equipped with a safety interlock system that will not permit the forming racks to return until the workpiece has been removed. Also, the working stroke is held up automatically until the part to be splined is properly located between the head and tailstock and the operator's hands are out of danger.

Special automatic loading and unloading devices have been designed to handle the high volume production from Roto-Flo spline rolling machines. This is in line with the present trend toward automation of such operations in the metalworking industry.

Use ACTION Card, opposite page 64, Encircle No. 2

Quenching oils

A new series of quenching oils has been developed by Sinclair Refining Co., Dept. B, 600 Fifth Ave., New York, N. Y.

The new oils, known as the Sinclair Quenchol 500 series, are said to offer greatly increased cooling power to assure a higher, more uniform degree of metal hardness as well as greater depth of hardness.

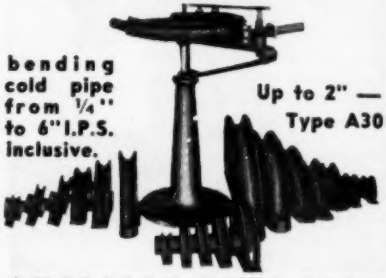
Heat dissipation of quenched metals is closely controlled by the Quenchol 500 oils to prevent cracking, pitting, distortion or warpage of product. Performance tests indicate the new oils will produce substantial reduction of piece rejection rates.

Use ACTION Card, opposite page 64, Encircle No. 3

"The American"

LINE OF COLD PIPE, CONDUIT AND HEAVY WALL TUBE BENDERS HAND AND POWER

ONE OF 10 HAND-OPERATED TYPES



bending cold pipe from ¼" to 6" I.P.S. inclusive.

Up to 2" — Type A30

AMERICAN TYPE 2PBR

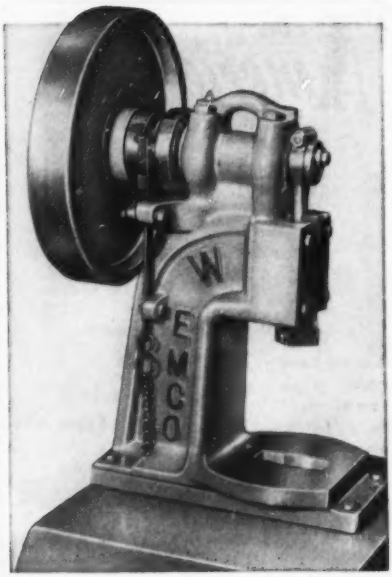
Designed for power application to our Type A-30 Hand Bender. Bends ½" to 2" Pipe at Radii approximately 5 times pipe size up to 180°. Complete, ready to run — no extras for standard machine. Min. radius bend—5 times pipe size. Max. radius bend—13". Complete with rolls for each pipe size. Standard motor equipment 2 H.P.

COMBINATION BENDING TABLES

For hot or cold bends of various shapes, pipes, bars, etc. 5' sq.; 7' sq. (3½' x 7' pairs) suitable for welding together. Other sizes or custom made to your specifications.

American Pipe Bending Machine Company, Inc.

9 Furnace Street, Poultney, Vermont



EMCO "W", bench type, 5-ton; also larger EMCO "X", 10-ton. Both sizes also stand-mounted. With or without motor drive.

EMCO POWER PUNCH PRESSES are SPEEDY and SAFE

Versatile EMCO presses excel for punching, forming, stenciling and riveting metal, leather, plastics and other non-metallic materials. Up to 300 operations per minute. "Big machine" speed, strength, rigidity, accuracy, endurance. Compact, fool-proof; simple design — easy to operate. Thousands of EMCOS in money-making use testify to Klaas' dependability since 1921.

Ask for our Bulletin "B-7"

UNUSUAL AIDS TO INDUSTRY

THE KLAAS MACHINE & MFG. CO.
4346 East 49th St.
Cleveland 25, Ohio

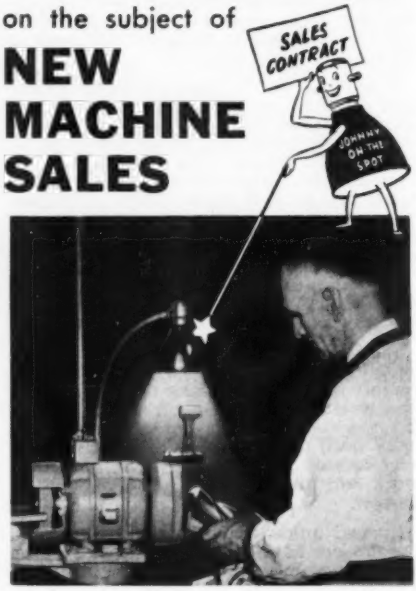
KLAAS-BUILT

VIMCO *Lights*

THROW SOME LIGHT

on the subject of

NEW MACHINE SALES



All industry is "tooling for competition"—the necessity for eliminating slowdowns, rejects, errors and injuries must be met! On-the-spot Vimcolight eliminates a major cause of these production headaches — adds "plus vision" to general plant lighting for close machine operations.

Write for Bulletin 85

SEE BETTER—WORK BETTER

VIMCO MFG. CO., Inc.

Since 1919
109 Brayton St. Buffalo 13, N.Y.

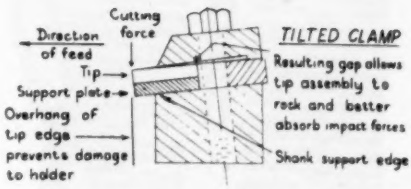
Introduce new cutting tool principle for longer tool life, faster production, less downtime, closer tolerances

St. Clair Tool Corp., Dept. B, 644 W. Mt. Pleasant Ave., Livingston, N.J., has introduced a new cutting tool principle in the Mech-Grip milling cutter and tool holder, wherein the cutting elements are non-rigid, cushioned against shock in the cutting area of the tool.

In the two cutting devices, the cutting edge overhangs the shank support edge by about 30% or more the width of the tip (dimension in line with direction of feed). The cutting tip is mounted on a supporting plate about the same size as the tip. The clamp which holds the cutting tip securely in place is canted in relation to the tip surface; the tip touches the clamp only at its front edge.

This design enables each cutting edge to give or roll with the punch when the entering shock is met. Minute chipping of the edge is said to be reduced, increasing tool life greatly.

In turning and milling, carbide about 92 to 93 Ra and hss at 68 and 69 Rc can be used on the most difficult work, it is claimed. Interrupted cuts on most materials also can be taken with these extra-

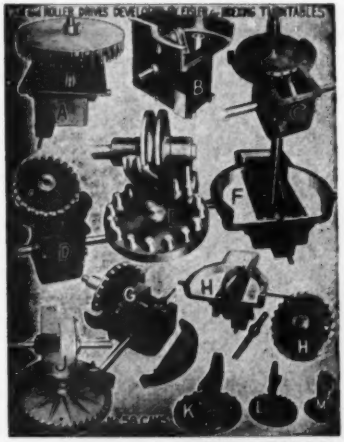

Cutting force
Direction of feed
Tip
Support plate
Overhang of tip edge prevents damage to holder
TILTED CLAMP
Resulting gap allows tip assembly to rock and better absorb impact forces
Shank support edge

hard tips, and at much higher cutting speeds than was thought possible.

Stopping a cut with the feed on and without damage to the point is another

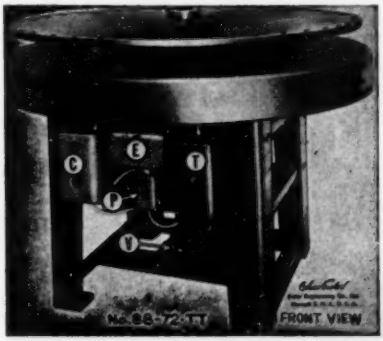
INDEXING TURNTABLES AND POSITIONERS

Eisler makes over 100 different types for welding, brazing, soldering, spraying, glass insulators, melting and glass glazing, with rotating stations and motorized or hand operated. Rotating tables of all kinds for over 33 years. We supply any part or complete equipment and we make special turntables to your order and cams made to order.



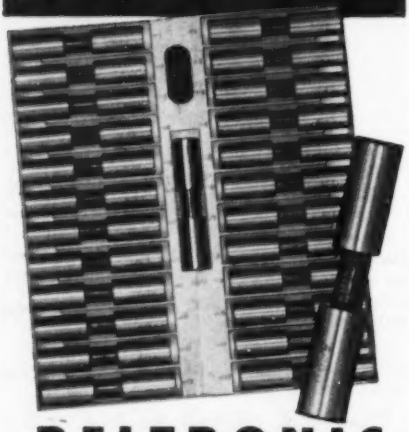
A SPECIALIZED CAM MILLING SERVICE, SPOT AND BUTT WELDING

CAMS



DR. CHAS. EISLER M.E., PRES.
EISLER ENGINEERING CO., INC., 762 So. 13th Street, Newark, N. J.

CLOSER PRODUCTION TOLERANCES!



DELTRONIC
Tenth Plug Gauges
save time and material, too!

This new system of precision gauging in sets of 25 provides one gauge of nominal size plus 12 gauges of increasingly larger sizes in .0001" increments and 12 gauges of decreasingly smaller sizes in increments of .0001".

- ★ Size variation by ten thousandths
- ★ Available in increments of 1/64" from 1/8" to 1"
- ★ Set of 25 costs approximately same as Go and No Go gauge
- ★ Hardness is Rockwell C62/C64

For further information write Dept. D.

DELTRONIC CORPORATION
9010 BELLANCA AVENUE
LOS ANGELES 45, CALIF.

advantage of the tools, according to the manufacturer. If the machine tool can be started with the tool stalled in the cut, damage is rarely done to the tool point. If the machine is not powerful enough to start up under this condition, it is necessary only to loosen the clamp bolt and withdraw the tip.

These tools can machine materials that are 63 to 65 Rc hard—in such cases milling replaces grinding, and the depth of cut while milling is limited only by the power of the machine tool.

Use ACTION Card, opposite page 64. Encircle No. 4

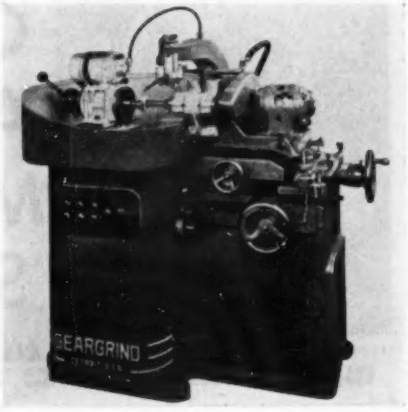
Universal oscillating grinder features versatility

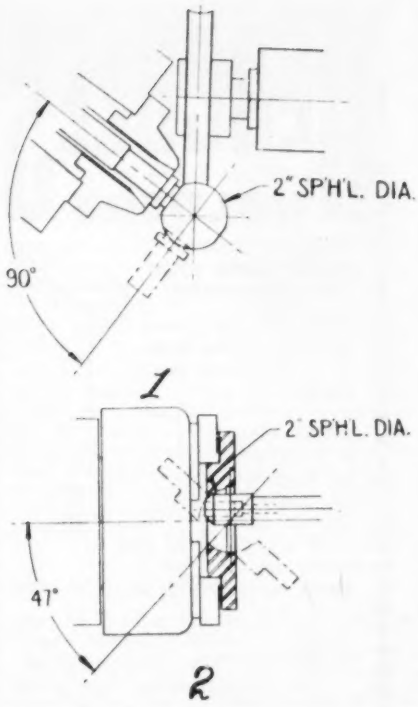
The Type OG-9x6 universal oscillating precision grinder manufactured by The Gear Grinding Machine Co., Dept. B, 3901 Christopher Ave., Detroit 11, Mich., was developed to fill the need for a grinder capable of finishing spherical, conical, and cylindrical surfaces, according to the company.

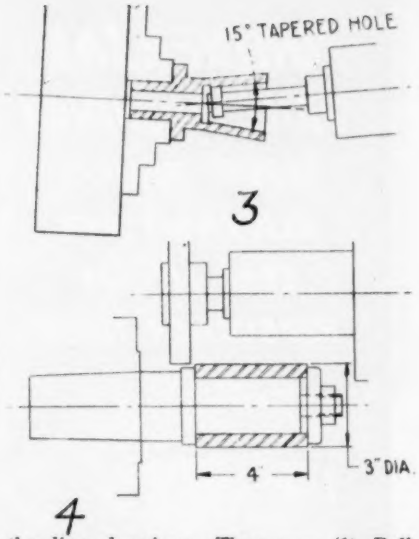
The work head is driven by a ¼ hp, 1800 rpm motor. Step sheaves in the v-belt drive enable three speeds to be used: 110, 230 and 360 rpm. The work head spindle may be equipped with collets, chucks or face plates. Adjustments allow the work head to be positioned parallel and normal to its axis of rotation.

For spherical surfaces, the work head is mounted on a table which can be oscillated by hand through a 180° arc, or power oscillated from 0° to 90° arc length. The oscillating drive can be disconnected by moving the selector switch.

Four types of jobs that can be accommodated on the grinder are shown in







the line drawings. They are: (1) Ball stud, alloy steel, carburized and hardened. Held in a collet; (2) flanged ball socket, cast iron. Held in a diaphragm chuck; (3) grinding wheel adapter. Grinding the tapered hole. Held in a precision 4-jaw chuck; (4) external cylindrical grinding.

Use ACTION Card, opposite page 64, Encircle No. 5

Get a better 'SURFACE GRINDER" job at less cost

ORDER DIRECT on our 10 day money back guarantee

RADIUS DRESSER $39.00

Diamond $7.00

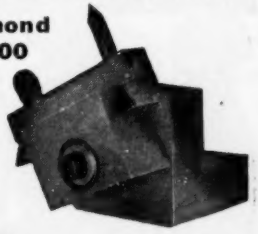
Hardened shaft—Bearing adjustable for wear Diamond always perfectly centered. Easily set adjustable 180° stops.

10" Wheel size for DoALL and NORTON Grinders—$44.00. Diamond $7.00.

SPECIAL 20" Wheel Size $110.00.

ANGLE DRESSER $44.00

Diamond $7.00



Ball Thrust Bearing. 24 Precision Ground Surfaces. Can be set very accurately with a Protractor or Sine Bar. Works underneath the wheel. Large bearing surfaces.

The "Mighty Midget" Line

SPERMAN METAL SPECIALTIES • 2197 E. 21st ST. • BROOKLYN 29, N.Y.

UNIVERSAL

DRILL BUSHINGS

INSURE PERFECT ALIGNMENT AND LONG LIFE OF PRODUCTION TOOLS

181-B

UNIVERSAL ENGINEERING COMPANY

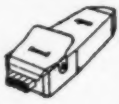
FRANKENMUTH 10, MICHIGAN

HERCULES

REG. U. S. PAT. OFF.

HOLDERS

AND SHOULDER STYLE STEEL TYPE FOR NUMBERING



Model HN Numbering Machines—Hand Style. All numbers on each wheel.

SPEED Model Numbering Machines for consecutive or random numbering in a press.

ACROMARKER Name-Plate stamping machines are made in several models and sizes for hand or foot operation.

ACROMARK Series 9A Marking Machines are widely used for product marking. Adaptable to marking tools and other items.

Write for latest literature and prices

The ACROMARK Company

15 Morrell St.

Elizabeth 4, N.J.

"The Original Marking Specialists"

Grinder, polisher uses belts up to 14'

Pictured here is a compact Hammond grinder-polisher using abrasive belts.

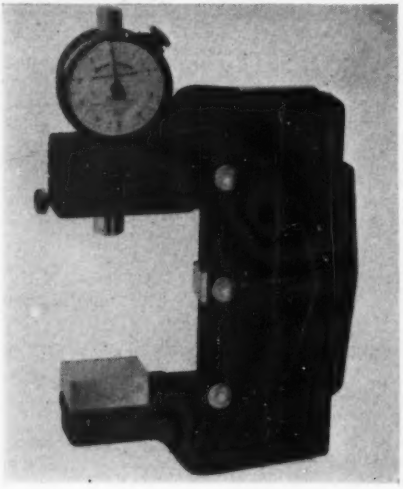
The mounting structure is attached to the base of the polishing lathe to which the backstands are mounted, instead of the more conventional method of mounting the backstands in back of the lathe.

Abrasive belts up to 14' long can be used on the Model VRO variable speed (1500 to 3000 rpm) and the backstands come in either spring or air-tensioned models. The same arrangement can be furnished with most Hammond polishing lathes. Hammond Machinery Builders, Inc., Dept. B, 1614 Douglas Ave., Kalamazoo, Mich.

Use ACTION Card, opposite page 64, Encircle No. 6

Fully adjustable indicating snap gage in 2 sizes covers 0 to 6" range

Reliant recently announced a new adjustable snap gage designed for all purpose use at the machine or for bench



SEE the actual operation of a Horton Chuck with the new Plastic Demonstrators.

ASK your Horton Distributor to show you Horton's Famous Five Extras, or write to . . .

HORTON
CHUCK
Windsor Locks, Conn.

TROYKE
ROTARY TABLES

- **Saves fixtures and time consuming setups.**
- **Saves time in circular positioning.**

CAM LOCKING TYPE ROTARY TABLES

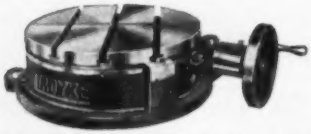
Three sizes: 12", 15", 18".

This model is intended for die sinking, bench work, and assembly of machine units when quick rotation and positioning are required.

STANDARD MODELS WORM WHEEL OPERATED ROTARY TABLES

Five sizes: 9", 12", 15", 21".

For die sinking, jig boring, cam milling. Indispensable in wood and metal pattern shops.



HEAVY DUTY MODELS WORM WHEEL OPERATED ROTARY TABLES

Three sizes: 18", 21", 25".

These larger, heavy duty models are used for jig work, planer jobs, and on horizontal boring mills.

DIVIDING ATTACHMENTS or DRILLING ATTACHMENTS can be furnished

SEE YOUR DEALER OR WRITE TO US FOR COMPLETE CATALOGS

TROYKE MFG. CO.

CINCINNATI 9, OHIO

inspection.

Gaging frames are of light rugged construction, according to the manufacturer, with the vertical sliding adjustment on the bar quick, with positive locking, for rigidity. The insulating gage handle provides an easy grasp and finger grip. Gaging contact buttons and anvils permit positive gaging, although indicator does not come in contact with the part being gaged.

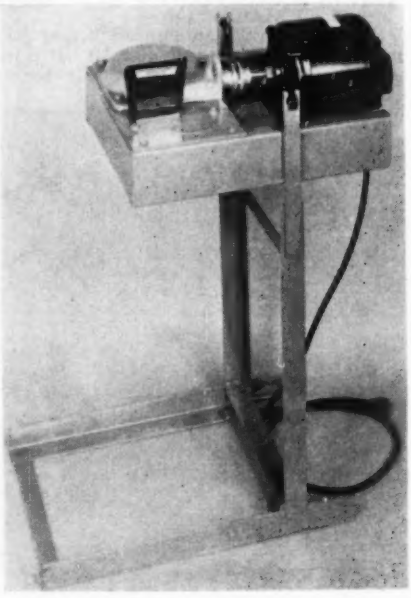
Gaging contacts are quickly removable and replaceable with other types for varied gaging requirements.

These gages may be used for precision inspection of large outside or inside diameters and lengths usually difficult to check. Full quick adjust is possible from 0" to 14" using an 18" bar, and longer lengths may be checked by using a standard ground ¼ by 1¼ bar of the length required. Reliant Industries, Dept. B, 4947 Firestone Blvd., South Gate, Calif.

Use ACTION Card, opposite page 64. Encircle No. 7

Scrap chopper saves space, handling costs

Northeastern Development Engineers Inc., Dept. MB, 21 High St., Pawtucket, R.I., announce a new balanced scrap chopper that saves space and handling



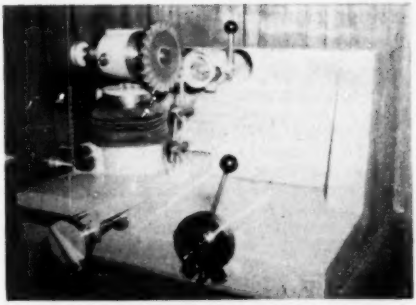
costs through portability and compactness. A major feature is an automatic feed system which adjusts itself in such a way that interference with the feed on the press is said to be practically nonexistent. This automatic feed is achieved through proper balance of the chopper which, together with proper weight distribution, causes the chopper to oscillate at the cutting speed of the chopper.

The unit is said to handle the very thinnest stock without jamming, buckling, bending or obstructing stock. Capacity is 3" wide x .050 thick. Oilite bearings throughout. Replaceable hardened tool steel blades. Needs no adjusting.

Use ACTION Card, opposite page 64. Encircle No. 8

Sterling Model RK-2 tool & cutter grinder

McDonough Mfg. Co., Dept. B, Eau Claire, Wis., has announced the Sterling Model RK-2 tool and cutter grinder. Specifications are: Wheel spindle—precision ball bearing, 3.000" taper per ft. for standard wheel holders, flat belt drive, 3450 rpm; spindle movement—anti-friction lever operated; capacity—maximum swing, 14", maximum distance between



centers, 14", face mills on workhead, 14"; range—longitudinal spindle movement, 10", infeed movement of workhead, 7", vertical movement of workhead, 6", max. distance c.l. wheel spindle to c.l. of workhead, 3"; workhead—anti-friction (precision Timken bearings), horizontal swivels, 360°, vertical 360°, taper hole in workhead spindle, No. 50 M.M.; bench space required—24" x 34"; shipping data—(approximate)—net weight, 585 lbs., shipping weight, 685 lbs.

Use ACTION Card, opposite page 64. Encircle No. 9

BELOIT ALLIGATOR SHEARS

Cut shows No. 2½ machine arranged for V-Belt drive and mounted on I-Beam Base.

Size No.	Shearing Capacity, Mild Steel Round	Square	Flats	Floor Space
2½	2½"	2¼"	8"x1"	122"x65"

Smaller sizes available. Tell us your shearing needs.

Write for Prices

HENDLEY & WHITTEMORE CO.
100 Blackhawk Blvd. Beloit, Wis.

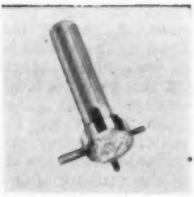
Holder converts four wrenches into one

The Brooks tool holder is said to convert four separate small finger wrenches into a combination hand tool designed to afford a full hand leverage in the seating of or the loosening of socket head screws and nuts as well as multiple-spline head screws and the Phillips head screws. For those hard-to-get-at screws, by the simple expedient of reversing the wrench you obtain the reach as well as the hand leverage.

The holder is made of Zamac alloy, weighs 4 ounces, is 4½" long with a ribbed handle that fits the hand. The No. 2 holder with its four progressive sizes of wrenches from ⅛" to 7/32" can serve 18 sizes of socket head screws and 5 sizes of socket head nuts. They are closely machined, so that wrenches are each wedged in their proper slots and held securely with a snap-on cap.

In addition to their ease of handling and insurance of proper seating, the wrenches are secure in a holder ready for instant use. The use of the holder eliminates the use of small pieces of pipe to obtain leverage.

An advantage is the savings effected



by the reduction in wrench losses in chips and scrap. The holders are not only a tool or assembly shop item but a kit item for every plane or machine using socket heads.

The No. 2 holder is in production; the No. 1, with .050 to 3/32" wrenches for 17 screw sizes, and the No. 3, with ¼" to 7/16" wrenches for 18 screw sizes and 4 nut sizes, will soon be in production. The Micro Tool Co., Dept. B, 10 Sigourney Street, Hartford 5, Conn.

Use ACTION Card, opposite page 64. Encircle No. 10

Gear racks added to Braun line

The Braun Gear Co. has recently included in its manufacturing facilities rack generating equipment. Through the use of this modern equipment, racks of almost any size, shape and material can

Notch 750 Pipe Ends per Hour

with ARC-FIT

REG. U. S. PAT. OFF

CLEAN NOTCHES
NO EXTRA FINISHING
NO DEFORMATION

Standard ARC-FITS notch ½" to 2" pipe for "T" joints. Dies for each size. Immediate shipment.

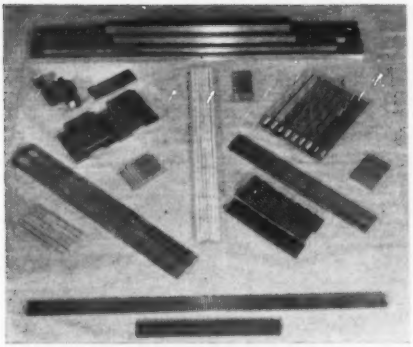
Special ARC-FITS for angular cuts or larger sizes. Send drawing and material specification for quotation.

Send for Descriptive Bulletin

VOGEL TOOL & DIE CORP.

1825 N. 32nd AVE. • MELROSE PARK, ILLINOIS

Standard Arc-Fit works well in our special HAND PRESS

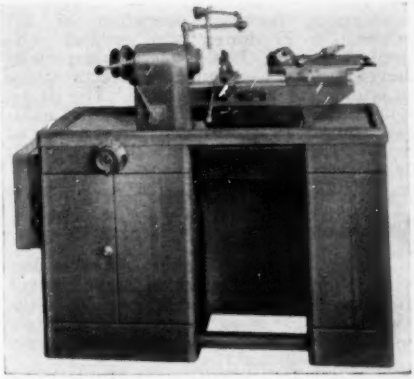


be made to meet requirements. These racks are produced by the generating principle with either straight or spiral teeth. Braun Gear Co., Dept. BR, 237 Richmond St., Brooklyn 8, N.Y.

Use ACTION Card, opposite page 64. Encircle No. 11

Wade announces new model hand screw machine

Said to embody many new mechanical and construction features, Model No. 73



hand screw machine has just been placed on the market by Wade Tool Co., Dept. B, 51 River St., Waltham, Mass.

The new method of driving the headstock spindle, with a timing belt, is said to eliminate many of the problems common to most drives, and will help in maintaining operating accuracy.

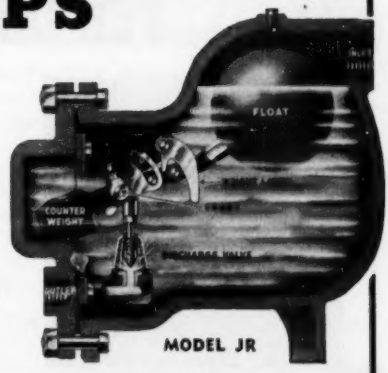
The new mechanical reverse gives instant reversals without disturbing the

SOLVE SLUDGE PROBLEM WITH NICHOLSON'S

New AIR TRAPS

With the introduction of a new oil-eliminating feature, Nicholson air traps enable you to enjoy the advantages of the positive intermittent action of a float-operated air trap without the common problem of oil congealing on the mechanism and impeding or stopping its action. Three types; pressures to 1500 lbs. For details send for . . . CAT. 953

117 Oregon St., Wilkes-Barre, Pa.



MODEL JR

W. H. NICHOLSON & CO.

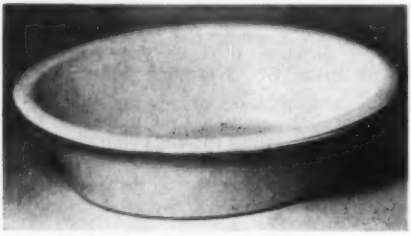
TRAPS · VALVES · FLOATS

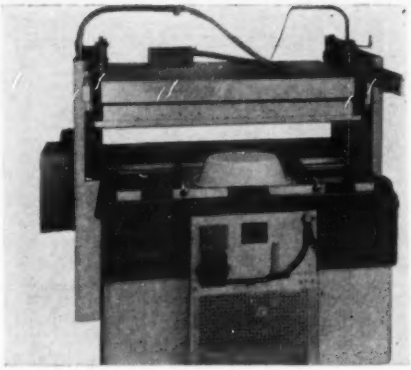
continuous forward operation of the motor. A hardened and ground self-centering bed has two symmetrically beveled sides, assuring balanced precision alignment of all attachments. The drive, completely enclosed in the pedestal cabinet, gives an infinitely variable speed with a top spindle speed of 3500 rpm. It is powered with a 1 hp motor.

Use ACTION Card, opposite page 64. Encircle No. 12

Vacuum machine molds plastics

Auto-Vac Drape Vacuum forming machines for plastics are said to be unique in that they are completely automatic; they are made in various sizes, completely enclosed and safe to operate. The pictures

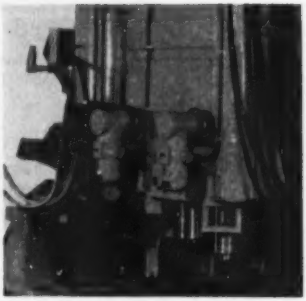




show how a plastic dishpan is formed with an ordinary enameled pan as a mold. Some of the products now being made on Auto-Vac machines include: refrigerator doors, air ducts, covers, inner door liners, toys, trays, washing machine covers, sewing machine parts, displays, Halloween masks, signs, mats, place mats, luggage, etc. Auto-Vac Co., Dept. MB, 2116 Post Road, Fairfield, Conn.

Use ACTION Card, opposite page 64. Encircle No. 13

Another Use For The FEN Automatic Wrench—



Illustrated above are two Model 8M Fen Automatic Wrenches operating quills on a Motch and Merryweather Heavy Duty Tank Milling Machine.

For detailed information regarding the application of the Fen Automatic Wrench to your machines, phone, wire or write.

The Fen Automatic Wrenches are being used to move and position quills on heavy duty milling machines. These wrenches are built with a dual torque range; thereby enabling the quill to be moved vertically upward with the higher torque and with the lower torque the quill can be lowered gently to a stop.

THE FEN MACHINE COMPANY

28915 Lakeland Boulevard

Wickliffe, Ohio

Universal form relieving fixture adds life per grind to end, side cutting tools

Royal Oak Tool & Machine Co., 29801 Stephenson Highway, Royal Oak, Mich., manufacturers of the D-S Radial Relief grinding fixture, have developed a new universal form relief grinder which will be identified as the "Royal Oak."

Royal Oak form relieving fixture

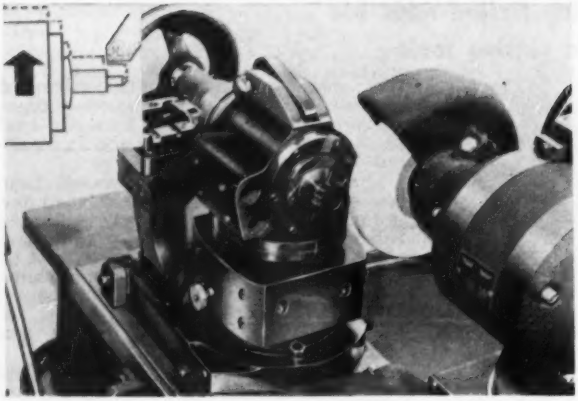
The grinder operates on a new principle and produces axial or radial relief, as well as any combination of the two.

Setup and operation have been simplified to the point that form relief can now be made the standard grind, for most end and side cutting tools. Cutting tool costs can be materially reduced by increasing the number of cuts per grind, made possible by form relief which leaves more metal behind the cutting edge and because of the fact that cutting edges are produced by grinding from the heel of the blade rather than back from the cutting edge.

The new "Royal Oak" universal form relieving fixture moves on hardened and ground ways operating on preloaded roller bearings. Instead of oscillating and rocking the tool into the wheel, motion is on a plane. The tool does not move above and below center on the wheel, but moves into the wheel on center for the entire grind, for better control and elimination of vibration.

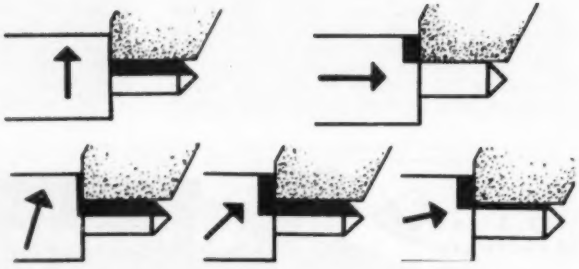
Activation is accomplished by the use of fast interchangeable cams. The cam follower is attached to one end of a pivoted bell crank on the opposite end of which is a plunger that forces the spring loaded fixture along the ways. A full 90° adjustment of the ways unit controls the direction of travel into the wheel, so that any relief, axial only, radial only and combinations can be accomplished.

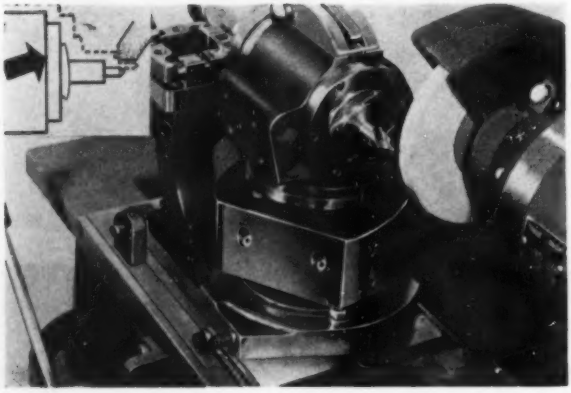
Five selective pivot points on the bell



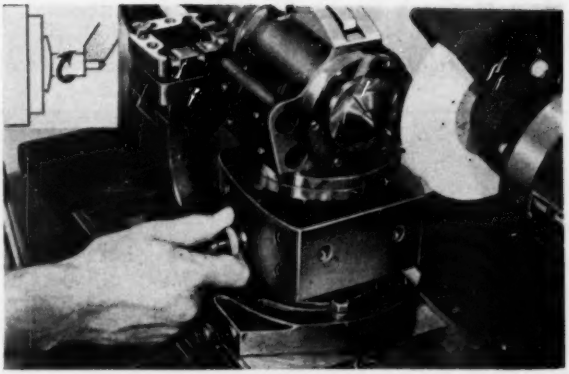
Setup for radial relief; carriage, spindle indicators should read 90°; carriage right angle to grinder table, spindle parallel with table.

(Top left) grinding radial relief; (top right) axial relief; (bottom three) any radial-axial combination.





For radial, axial relief, turn carriage to angle necessary for combined relief; spindle remains parallel with table; tool moves into wheel.



Cylindrical grinding, turn knurled thumb screw compressing carriage return spring and releasing pressure on plunger and cam follower; spindle turns free; grinding to index also possible with plate and plunger.

crank enable the operator to relieve varying amounts with any cam of one to 16 impulses. Change of cam or setup of the fixture for a specific relief is accomplished quickly. Only two adjustments are involved: (1) Loosening a nut and turning the carriage for the amount of axial and radial relief desired. (2) Turning a nut and setting the spindle parallel with the table.

Both adjustments are machine calibrated for 90° and easy to read. No gages are needed and no attachments are required nor parts removed. Setup is made on the grinder.

Circle grinding can be performed with the "Royal Oak" by simply turning a knurled thumb screw which releases contact of the follower on the cam.

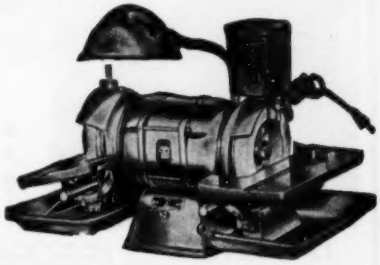
Use ACTION Card, opposite page 64, Encircle No. 14

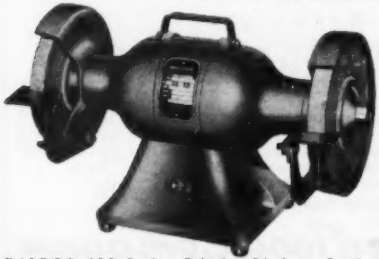
Baldor TOTALLY ENCLOSED GRINDERS

"Sealed for life" ball-bearings

Special Carbide Tool Grinder

BALDOR Grinder No. 500—built especially for sharpening carbide tools quickly and accurately. Reversible ½ h.p., capacitor type Baldor motor; heavy shaft, large ball-bearings. Dynamically balanced armature. Motor withstands repeated overloads. Protractor at each end of grinder. Complete as shown at right, **$149.20.**





BALDOR 600 Series Grinder ¼ h.p., 1 ph., 60 cycle, 3450 r.p.m., 6" wheels. $49.00

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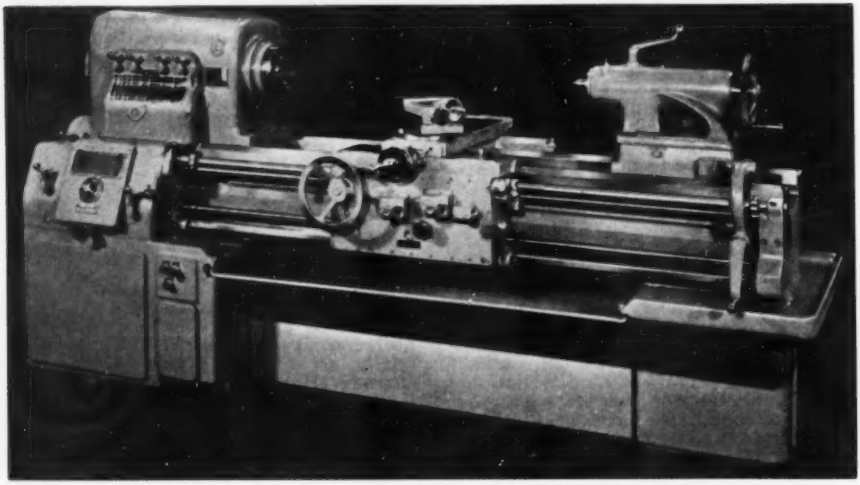
BALDOR ELECTRIC Company

4368 Duncan Ave. ST. LOUIS 10, MO.

New Monarch Series 61 lathes introduced

Providing power rapid traverse and other important design refinements and construction improvements for precision performance under continuous, heavy-



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Rolls Same Diameter	.0001"
Top Parallel	.0002"
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Rolls Parallel	.0002"

Hand Scraped Roll Seats
Precision Ground
Double Normalized
Satisfaction Guaranteed

BALD EAGLE SINE PLATES

Article Number	Center Distance	Width	Length	Shipping Weight	Price of Sine Plate Only	Price of Sine Plate & Oak Case
1605	5"	3"	6⅝"	6½ lbs.	$32.50	$38.00
1610	10"	5"	11⅞"	23 lbs	$80.00	$86.00

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Send your order today! Prices F.O.B. St. Paul. Shipment within one working day of receipt of your order.

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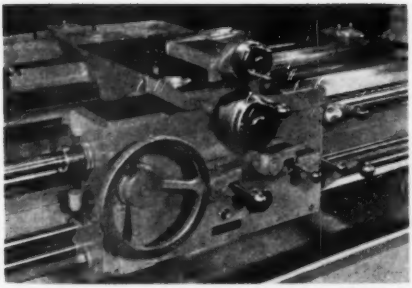
Bald Eagle Tool Company

Newton Building, St. Paul 1, Minn.



duty service conditions, a new Series 61 line of engine and toolmakers' lathes has been developed by The Monarch Machine Tool Co., Oak Ave. & Maple St., Sidney, Ohio.

The new models are available in 13", 16" and 20" sizes. For the first time they incorporate, in a full range of swings, built-in apron-controlled power, rapid traverse to the carriage and cross slide.

Longitudinal movement, right or left, is 160" and cross-movement, in or out, is 75" per minute. A safety clutch is provided for all traverse movements, which disengage automatically if they jam accidentally. Another feature is a direct-length reading dial which, built into the apron, facilitates multiple diameter turning and blind hole boring.

Other features include totally enclosed gear box and end gearing, automatic pressure lubrication, anti-friction bearings, helical-geared headstock utilizing ground or shaved gears, American standard Camlock spindle nose, flame-hardened and precision-ground integral bedways, and all critical parts made of hardened alloy steel.

In addition to the standard 13", 16" and 20" sizes, Monarch Series 61 engine and toolroom lathes are also available in numerous plus-swing sizes. Leadscrews, feed rod, control rod and traverse rod on longer bed units are continuously supported by traveling carriers. They are automatically picked up or dropped off by movement of the apron.

Use ACTION Card, opposite page 64, Encircle No. 19

Amadori lathe for precision turning

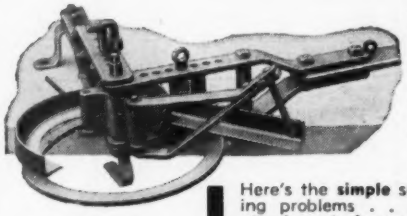
A precision turning lathe, distributed by Amitool Co., Dept. B, 629 Main St., Westbury, N.Y., claimed suitable for close tenth work because of the well proportioned ways and carriage, has been

one man
one bender
with
HYDRAULIC ATTACHMENT

HOSSFELD

UNIVERSAL
IRON BENDER

BEND ANGLE IRON
INWARD or OUTWARD



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BENDS ON
THIN WALL
CONDUIT

Bends Flat,
Round, Bar,
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Here's the **simple** solution to two of your most difficult bending problems . . . angle iron and conduit. These **special** attachments for your HOSSFELD Iron Bender bend these **special** materials neatly, quickly, accurately to your exact specifications . . . a smooth, easy, one-man operation. Ask about the HOSSFELD Hydraulic Attachment that gives you complete mechanical operation.

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Order Zagar Collets and Collet Fixtures at These Low Prices

Zagar has a fixture for every collet tool application. Order NOW from your local tool supplier.

STOCK DELIVERY!

ZAGAR INDEXING FIXTURE

1"—$185

2"—$285

ZAGAR HOLDING FIXTURE

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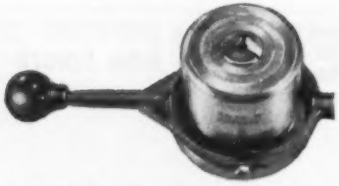


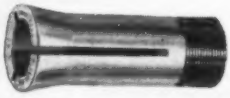
COLLET LATHE CHUCK

1"—$125 2"—$185

AIR-OPERATED FIXTURE

1"—$165 2"—$195

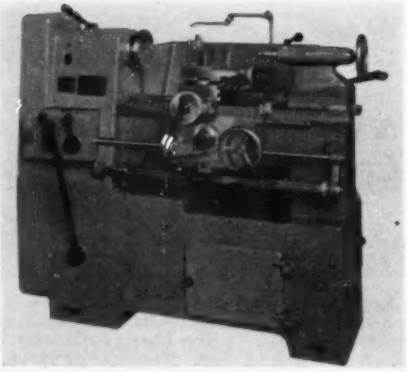
5-C COLLET—



$4.90 W & S No. 2—$6.75

ZAGAR TOOL, INC.

24000 LAKELAND BLVD., CLEVELAND 23, O.

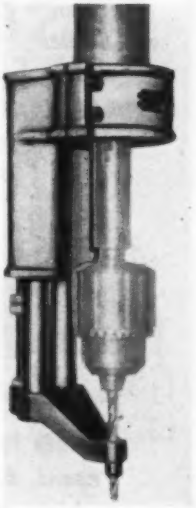


announced.

The Amadori has a 16" swing and a center distance of 20". Spindle is mounted on special precision roller bearings; has speed up to 3600 rpm. Hole through spindle is 1⅛". It is equipped with 12 position automatic longitudinal stops and six position cross slide stops. Powered by two speed motor providing 1½ and 2 hp.

Use ACTION Card, opposite page 64. Encircle No. 20

Quick change drill bushing adapter



Used for multiple spindle drilling, the Quick Change drill bushing adapter is designed to eliminate the time required to insert and remove drill bushings in jigs for multiple operations. By this method, the operator's time consists only of moving to the next spindle and performing the operation. Temporary or short run tooling may be used without drill bushing liners in the jig or template, for the drill bushing is held by the adapter.

Incorporated in the adapter is the Thompson ball bushing, for free travel in each direction. Ball bushing and springs are fully enclosed from all outside chips and dust. All working parts

hardened.

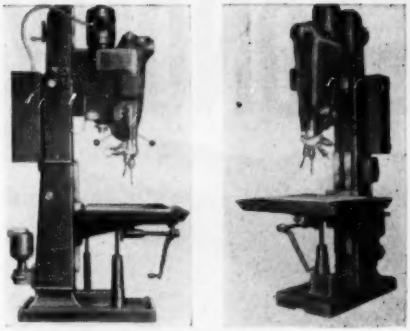
All five sizes of the adapter are interchangeable with the complete assembly, accommodating from No. 58 to 1-13/32" drill or reamer sizes. Sheridan Products, Dept. MB, Inglewood 3, Calif.

Use ACTION Card, opposite page 64, Encircle No. 21

New turret drilling machine space, time saver; each of 6 turret spindles set independently

The turret drilling machine just announced by Howe & Fant, Dept. B, 26 Fitch St., E. Norwalk, Conn., is a new development that is claimed to do for drilling what the modern turret lathe does for turning and to offer savings in handling and setup time, floor space, capital investment and maintenance.

Up to six different drilling and tapping operations, in any sequence, can be done by a single operator at a single station. No time is lost moving. Speeds, depths, and reversals for tapping are all determined at setup and require no attention during successive operating cycles. Speed of each of the six turret spindles is independently set, and is infinitely variable between 200 and 4000 rpm. Depth



stops are individually set for any or all turret spindles, and are said to be accurate to less than 0.002".

For tapping, automatic reverse at twice forward speed is available at each spindle. Drill capacity is ½" in steel; 34x50 inches of floor space required.

Use ACTION Card, opposite page 64, Encircle No. 22

New type flexible couplings

A new modification of the standard Lovejoy Type C coupling, known as the Type CIF, is a standard Type C coupling

American Standard
Perforators
For Improved Production Schedules - Reduced Die & Maintenance Costs.
Precision Ground For High Production. In All Sizes .040 to .875
Use Them In The Dies You Make, Specify Them In The Dies You Buy.
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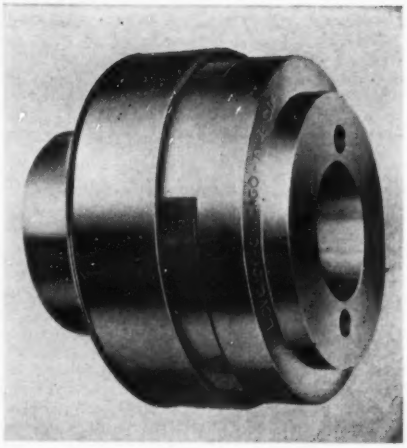
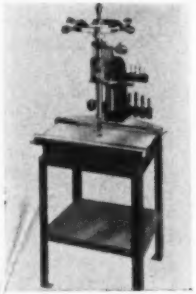


with one hub cut off. Three or more holes are tapped in the remaining flange, by which the coupling is fastened to the center of the flywheel.

Thus, according to the manufacturer, by "crawling" into the flywheel itself, this modified coupling not only saves the space normally taken up by conventional hub-length, but also affords a cost savings over standard flywheel couplings in the elimination of the flange. Lovejoy Flexible Coupling Co., 5029 W. Lake St., Chicago 44, Ill.

Use ACTION Card, opposite page 64. Encircle No. 23

Spindle balancing device



Lassy hand tapping machines are now equipped with a new spindle balancing device that offsets the weight of the spindle assembly and operator's hand. This combined weight, of approximately 8-10 lbs., tends to force the tap, which, especially in small tapping and soft materials, is highly undesirable and detrimental to achieving desirable results.

The balancing attachment is readily adjusted to compensate for various size taps

and differential in the operator's hand pressure. The balance weight is set so that a slight downward pressure starts the tap cutting, allowing top, when retracted, to float free, leaving top thread undamaged. The free floating action achieved is said to produce good fits, lengthen tap life and eliminate broken taps due to jamming.

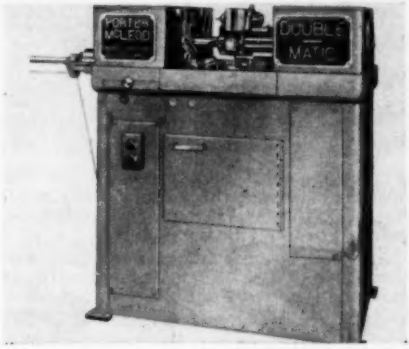
All moving parts are hardened to prevent wear and to maintain a free sensitive movement. The unit can be readily attached to machines now in service by drilling two holes for 8-32 screws in the arm bracket. Lassy Tool Co., 108 Bohemia St., Plainville, Conn.

Use ACTION Card, opposite page 64, Encircle No. 24

Automatic single spindle screw machine finishes front and back ends of workpiece in single cycle

The new automatic spindle screw machine with a four-position tool holding turret revolving on an axis parallel to the spindle, has been announced by Porter-McLeod Machine Tool Co., Inc., Dept. MB, Hatfield, Mass.

Forming and cut-off tools are mounted on the front and rear cross slides, which are independently cam actuated. As with other screw machines, the stock is fed through, clamped and machined. However, the final turret position is occupied by a live spindle which contains a collet and runs at the same speed as the main drive spindle. This live spindle grips the work, supports it during cut-off and continues to hold it. Then, while turret tools machine the next piece, the back end



ROOFE *Heavy Duty* BULL NOSE CENTERS

Two double rows of ball bearings in the large and small ends of this Bull Nose Center mean perfect alignment on any type of work.

Guarantee Perfect Alignment

Two shank sizes provide diameters from ½" to 7½" for a variety of work with a single center. Write for catalog.

Distributors Wanted.

HOUSTON GRINDING & MFG., CO., Inc.

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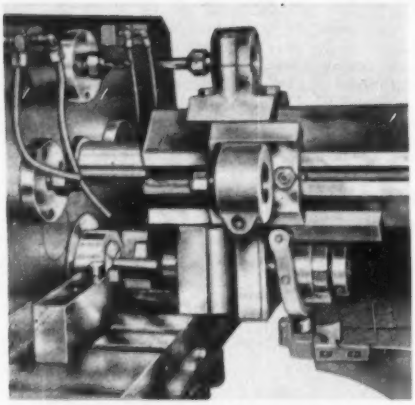


is machined by tools mounted on the headstock. When the cycle is completed, the work is ejected from the live spindle before grasping the next piece.

All tooling and chucking motions are cam-actuated. The main spindle is mounted in two double-row precision ball bearings. All other shafts except those running at extremely slow speeds run in ball bearings.

The Double-Matic turret is rigidly supported at both the headstock and tailstock ends. This is said to make possible extremely heavy feeds and accurate drilling, reaming and tapping. The added support given the work by the live spindle enables the Double-Matic to take extremely heavy forming cuts.

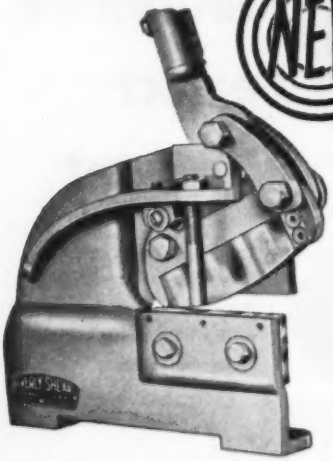
This unit can form, point and cut off ½" dia. chrome-molybdenum center drill blanks in less than 20 seconds. The live spindle holds and drives, preventing the work from springing away and permitting smooth cut-off, with no teat or burr in the center.

Positioning is accomplished by a hardened and ground steel index plate which slides on hardened and ground steel ways. As a result, extremely close tolerances can be attained, producing work lengths accurate within two or three thousandths.

Use ACTION Card, opposite page 64. Encircle No. 25

Air-O-Limit centerless grinder gage

Several well known Air-O-Limit gaging components have been combined to form a unique gage for use on centerless grinders, it has been announced by Pratt



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EXCLUSIVE DESIGN . . . Cleaner Cuts
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CAPACITIES TO 3/16"

Get faster, easier slitting and trimming with a new design Beverly "SS" Series Slitting Shear. Rigid, strongly braced frame; compounded linkage and extra strength where needed. Many exclusive features. Write for FREE illustrated Bulletin.

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SS-3A" slitting cap; ¼" trimming; 5/16" x 2" bar capacity.

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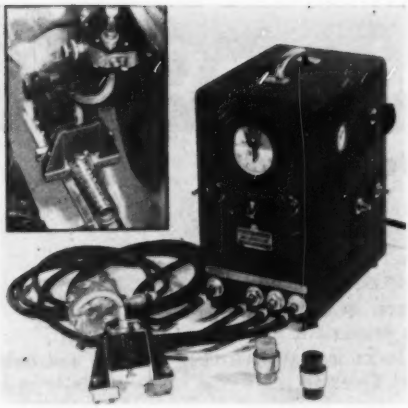

& Whitney, Division Niles-Bement-Pond Co., 22 Charter Oak Blvd., West Hartford 1, Conn. Consisting of a P & W Air-O-Limit snap gage, booster check valve and light signal control unit, the combined units are called the Air-O-Limit centerless grinder gage.

The light signal control cabinet includes a standard gaging indicator calibrated to meet requirements, Nullmatic and Kendall regulators along with pressure gages, pneumatic precision relays with electric pressure switches and red and green limit lights for over and under size indication.

Basically, the gaging circuit used in this application is the standard back pressure gaging system used so succesfully on all P & W Air-O-Limit gages. Readily adjustable control limits can be pre-set to any desired scale setting to meet varying tolerance requirements. The insert shows the snap gage and the booster check valve mounted on a centerless grinder, gaging through-feed ball bearing outer raceways.

Use ACTION Card, opposite page 64. Encircle No. 26

Hammer blow installs new blind rivet

Installed from one side of the job by one man working without special tools, a new 5/32"-diameter Southco blind rivet is applied with only a hammer. The rivet is inserted into a hole, and the pin protruding from the rivet head is struck with a hammer. Four prongs on the blind end of the rivet are thus expanded, forming a second head and pulling panels tightly and permanently together.

No finishing operations are needed. The

Hammond of KALAMAZOO
2 IN 1
NO-DUST GRINDER
SAVE OVER 50% FLOOR SPACE THE HAMMOND WAY
OLD WAY
BUILT-IN DUSKOLECTOR
DUST-LADEN AIR IS A MENACE!
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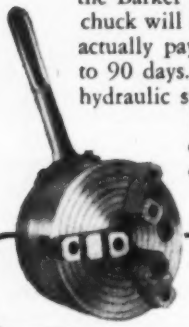
Labor Saving Production CHUCK

Will pay for itself in 60 to 90 days

On turrets, engine lathes, cutting-off machines, drill presses or any type of chucking machine, the Barker Two-Jaw or Three-Jaw hand operated chuck will increase production up to one third and actually pay for itself while doing it in from 60 to 90 days. Hand lever eliminates pneumatic and hydraulic systems, yet closes and locks jaws with lathe running or stopped. Over 30 years of labor saving, production boosting operation.

Write for bulletin 201 today.



CHUCK DIVISION
THOMAS HOIST CO.
24 S. HOYNE CHICAGO 12, ILL.

REHNBERG-JACOBSON DRILL UNITS

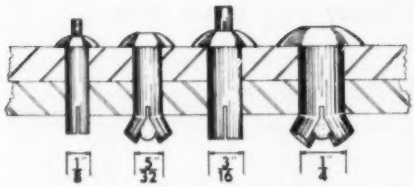
Self-contained Drill Units are fully-automatic and cam-operated for positive quill action. They come in five sizes with drill capacities ranging from 3/16" to 1-1/2" (in mild steel).

These units are all available for *quick delivery.* You can mount them on structures of your own to make practical and efficient production machine tools.

Write for Literature

REHNBERG-JACOBSON MFG. COMPANY

DESIGNERS & BUILDERS OF SPECIAL MACHINERY — R-J — 2135 KISHWAUKEE ST. ROCKFORD, ILLINOIS

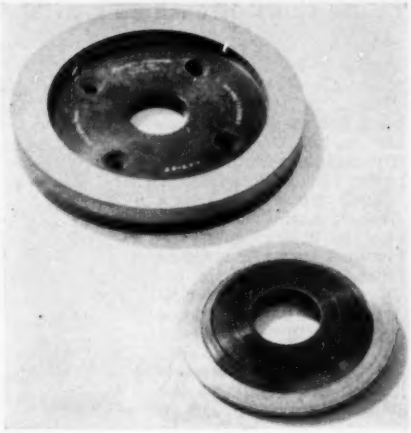


Southco blind rivet is now produced in four diameters (⅛", 5/32", 3/16", and ¼") and in a range of grip lengths from 1/32" to ⅝". Southco Div., South Chester Corp., Dept. B, Lester, Pa.

Use ACTION Card, opposite page 64. Encircle No. 27

Diamond wheels feature steel bond, plastic center

A new line of longer life diamond grinding wheels has been introduced by the Precision Diamond Tool Co., Box 274, Lake St., Elgin, Ill. A new ingredient has been added to the P.S.M. steel bond which gives it adequate porosity to efficiently grind carbide, the manufacturer claims, with two to four times the life of many wheels. Steel bond wets and bonds itself to the diamond particles, keeping them from pulling out.



All cup and periphery wheels in the new "Economy" line are made with plastic centers that absorb the spindle and grinding vibration and produce a smooth action comparable to resinoid bonded wheels, it is said.

Use ACTION Card, opposite page 64. Encircle No. 28

The
LINLEY JIG BORER

Put your small jig boring jobs on this precision machine

Here's a machine, available at extremely low cost, that will enable you to save your larger machines for larger, heavier work. You'll find it meets your most exacting requirements for precision. Get our accuracy information and you'll see what an outstanding investment this machine represents.

Table movement: 6"x10"; table size, 7"x17½".

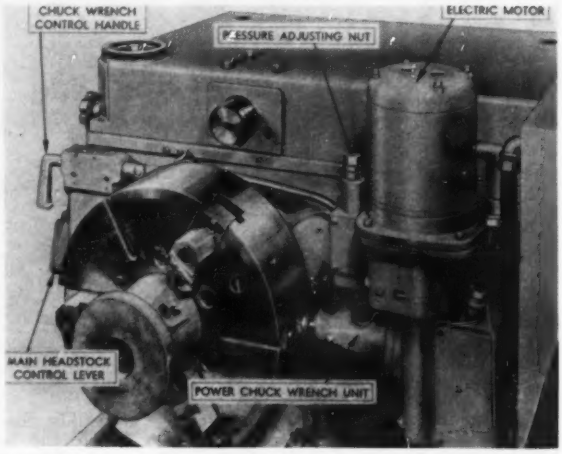
Send TODAY for complete information.

LINLEY BROTHERS COMPANY
663 State St. Ext., Bridgeport 1, Conn.

Power chuck wrench unit on W & S heavy duty turret lathes

Among attachments available for the recently announced new line of Warner & Swasey heavy duty turret lathes (Models 1A, 2A, 3A and 4A) is a completely re-designed power chuck wrench unit.

The power chuck wrench enables the operator to chuck even the heaviest forgings with no more effort than is required to open a door, it is said. An electric motor operating through a controlled torque clutch does the work. A pressure adjusting nut regulates the gripping pressure of a multiple disc clutch with an infinite number of settings to grip the heaviest forgings securely, or the most delicate work without distortion.



The pistol grip control handle for the power chuck wrench is mechanically interlocked with the main control lever on the headstock of the machine providing complete safety of operation. Before the chuck wrench can be engaged, the main control lever must be in the brake position. And when the chuck wrench is being used, the main control lever

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300 cfm to 10,000 cfm

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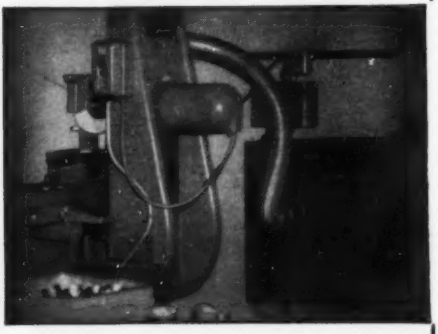
Ask for Catalog 605-3. Describe dust problems for recommendation by return mail — no obligation.



AGET-DETROIT CO.

502 Main St. Ann Arbor, Michigan

cannot be moved out of the brake position to engage either the forward or reverse drive clutches.

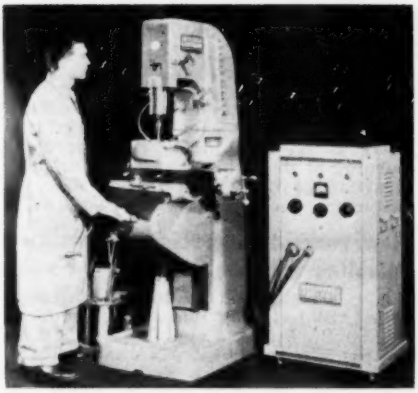
To provide the necessary additional breakaway torque when releasing a piece, a solenoid booster sets the torque clutch tight permitting the full motor torque to be applied to the chuck for opening the jaws. Reversal of direction of the solenoid booster for internal or external chucking is obtained by a selector switch on the machine's control panel. The Warner & Swasey Co., Dept. BB, 5701 Carnegie Ave., Cleveland, Ohio.

Use ACTION Card, opposite page 64. Encircle No. 34

Ultrasonic 30,000 cycles per second machine announced

A newly designed "Trail Blazer" model Sheffield Cavitron ultrasonic high precision machine tool is announced by the Sheffield Corp., 721 Blue St., Dayton 1, Ohio.

The Cavitron is claimed to accurately produce holes as small as .012 diameter or slots of that width, in the hardest materials, at almost incredible speed and low cost. It will sink blind, through, tapered or curved holes of almost any desired shape and depth; engrave or type



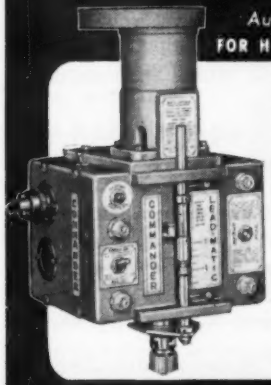
matrix dies; cut keyway and oil holes; machine serrated root forms of jet turbine blades; and perform countless other operations.

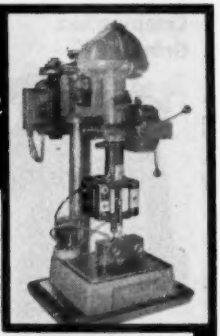
The Cavitron uses an inexpensive tool (such as soft steel) for the precision cutting of hard or brittle materials, either ferrous or non-ferrous, including those which are non-magnetic and non-

Commander LĒAD-MATIC Tapper

Automatic Tapper with Lead Screw

FOR HIGH PRODUCTION PRECISION TAPPING





- Precision Ground Lead Screws Assure Finest Threads
- Electrically Controlled Cycle or Jog Tapping Action
- Hand, Foot or Fixture Switch Control
- Easily Adapted to Any Drill Press
- Range #0 to ¾"

Built for high production tapping . . . precision or otherwise, the Commander Lēad-Matic Tapper makes any drill press a precision tapping unit, even with inexperienced operators. Electric control of Cycle or Jog tapping action provides versatility to handle any job . . . automatic tap reversal eliminates drill press motor reversing and speeds tapping. Compact, ruggedly built, easy to operate, the Commander Lēad-Matic Tapper will cut your tapping costs and reduce rejects to a minimum.

Write for illustrated circular and name of nearest Distributor.

Commander MFG. CO.

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conductors of electricity. The operation is accomplished by the use of an ultrasonic tool head vibrating from 18,000 to 30,000 cycles per second while a pump provides a continuous flow of abrasive grit in solution over the work surface. Extremely fine finishes are obtained and there is no local heating or electrical burning of the work or chemical or physical change in the work piece.

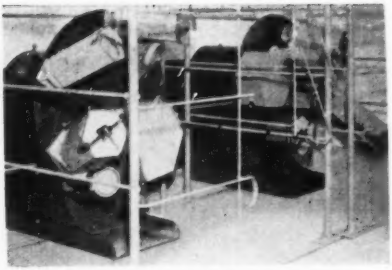
Use ACTION Card, opposite page 64. Encircle No. 35

New concept in precision tumbling slide honing

A new approach to tumble finishing called "SlideHoning" has been announced by the BMT Mfg. Corp., Dept. B, 110 E. 9th St., Elmira Heights, N.Y.

The equipment is a multi-barrel unit with a 48" revolving disc on which can be mounted as many as 25 barrels with a variable rotating speed from 11 to 28 rpm and with different sizes and shapes of barrels available plus a range of mountings. This makes possible a combination of rotary, centrifugal and slide tumbling actions all at one time.

The controlled-motion-honing possible with the BMT multi-barrel unit removes burrs, flash, tool marks, rust, paint, plating, heat treating scale, and does not affect the dimensional tolerances of the work piece. Such operations as rounding corners, forming fillets, and blending chamfers can all be successfully done with the finished surface and the appearance of the part materially improved. The BMT equipment permits one operator to do effective finishing on a variety of work pieces, as many different parts can be done on the same machine without mixing, and both wet and dry tumbling can be done at the same time.



A safety cage completely encloses the equipment and is so arranged that the gate must be closed before the machine

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by sharpening just one gross of hack saw blades

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The EC Grinder creates a natural cutting edge, because new blades usually are ground *before* hardening. The only grinder that does not depend upon the shape of the grinding wheel to form the shape of the teeth—enables you to grind a variety of blades without dressing or changing wheel.

Write for Bulletin describing the remarkable EC Grinder

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KUTMORE ADJUSTABLE HOLLOW MILLS

ENGINEERED FOR . . . PRECISION PRODUCTION

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- CUTTING CAPACITIES FROM 1/32" to 2" DIAMETER IN STANDARD STOCK. IMMEDIATE DELIVERY.

WRITE FOR CATALOGUE No. 20-BB

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SIZES 3/16" TO 1 1/4"

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FINEST QUALITY STEEL SHANK AND SLEEVE

BRIGHT PLATED FINISH

STRONG PLASTIC HANDLE.

PICKS UP · PUTS ON AND TIGHTENS!

. . . IN A ONE HAND OPERATION—

- **GRIPS** nuts or bolts of any material
- **HOLDS** firmly in any position
- **TIGHTENS** nut or bolt securely
- **RELEASES** at the pull of the fingers

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141H Brewery St., New Haven 7, Conn.

will start. The operator can open the gate with a touch of the finger or toe and the machine will automatically stop, assuring maximum safety and greatest ease for loading and unloading of the barrels. The BMT unit without cage requires 4 ft. x 4 ft. of floor space, and with cage 7-ft. 4-in. x 6-ft. 6-in.

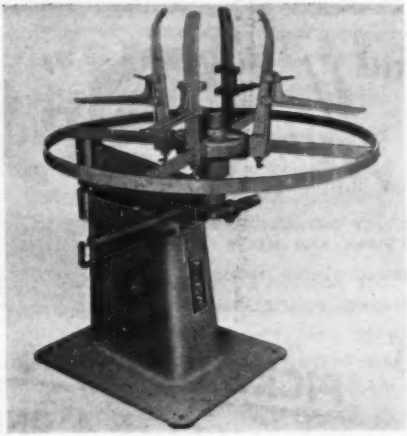
Two types of barrels are provided: A stud-mounted type that bolts directly to the rotating disc, and a quick-adaptor type that has a safety lever connection which permits instant mounting and removal from the machine.

Use ACTION Card, opposite page 64. Encircle No. 36

Nilson clutch reel has automatic stop control

A new type medium size wire and stock reel designed with a 4″ oscillating movement is now being manufactured by the A. H. Nilson Machine Co., Dept. B, 1511 Railroad Ave., Bridgeport, Conn. The oscillating feature reduces the load on the feed mechanism of the machine and, by means of a limit switch, automatically stops the machine in case of wire entanglement on the reel.

Used with medium size wire coils, the new clutch reel is especially useful in



shops where one operator handles more than one machine.

The reel is furnished in two sizes. The Model 51-L has a coil capacity of 175 pounds and an 8″ minimum inside diameter. The Model 51-M has a 250 pound coil capacity and a 12″ minimum inside diameter. A. H. Nilson Machine Co., Dept. B, 1523 Railroad Ave., Bridgeport, Conn.

Use ACTION Card, opposite page 64. Encircle No. 37

Cincinnati Flamatic demonstrates new low cost selective heating

A complete line of selective heating equipment, featuring the first commercial application of electronic temperature control to automatic brazing, is being demonstrated by the Flamatic Div., The Cincinnati Milling Machine Co., Dept. B, Cincinnati 19, Ohio.

In addition to the standard Flamatic hardening machine, the new Flamatic power control unit is used with two "work processing" units which combine high heating capacity, precise temperature control and low cost tooling.

The Flamatic brazing unit has a turn table with six stations, which rotates and indexes continuously. It has been demonstrated brazing an automotive breather tube assembly at the rate of 400 parts per hour.

Special feature of this unit is a radiation pyrometer, focussed on the final heating station, which controls the temperature of the brazed portion. Operation is automatic except for loading and unloading.

A new 6-spindle Flamatic hardening unit accommodates shafts up to 36" long and 1½" dia.; has three feed rates in either direction; any feed rate can be from 2" to 40"/minute, rapid traverse 360"/minute; part can be preset to "dwell"

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at up to four positions.

Flamatic automatic brazing unit processing breather tube assembly is shown in photo. Special radiation pyrometer focussed on work at heating station insures precise control of temperature and uniform results. A record of each heating cycle may be made on the chart.

Use ACTION Card, opposite page 64. Encircle No. 38

Scully-Jones floating holder features improved collet action

A new "lock-and-eject" type floating holder, for use on multiple spindle reaming and tapping machines, provides a more powerful, truer collet action on the shank of the cutting tool, according to officials of Scully-Jones and Co., Dept. B, 1901 S. Rockwell St., Chicago 8, Ill. The new holder combines the advantages of unrestricted float with easier, faster insertion and ejection of tools.

A threaded nut on the nose of the holder revolves freely on ball bearings, drawing the threaded chuck into the taper seat and compressing it evenly on the shank of the tool. Four-split tap chucks are said to provide a more powerful, accurate collet action, according to tests made by Scully-Jones. Reamer chucks

are split on two sides.

Drifting is not necessary to remove the tap or reamer. Operator merely twists threaded nut in the reverse direction, easily ejecting tool from the chuck. Since

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For Tools and Small Parts

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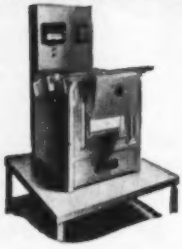
THE COOLEY BENCH MODEL

for HARDENING AND TEMPERING



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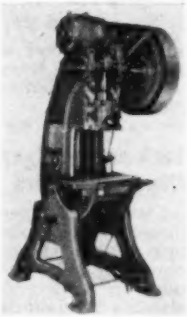
drift holes are thus eliminated from the body of the holder, more efficient sealing against chips and dirt assures longer life of the floating mechanism.

New "lock-and-eject" type floating holders of special design are available with tension and compression features to compensate for spindle feed and tap pitch variations and reduce tap breakage. Three standard sizes with a range of adjustable adapter shanks are now in production.

Use ACTION Card, opposite page 64, Encircle No. 39

New 20-ton press announced by Walsh



New Walsh Model 20X deep throat 20 ton press is said to be the ideal substitute for screw presses and therefore suitable for tool room die tryouts, shearing in dies or punches, also for large or small production runs.

This new press built by Walsh Press and Die Co., Div. of American Gage and Machine Co., Dept. B, 4709 W. Kinzie St., Chicago 44, Ill., has die forged crankshafts and ball screws, bronze bearings, etc. All moving parts are precision ground or hand scraped.

The 20X is inclinable, locks positively in any position, can be furnished with vari drive and automatic lubrication.

The Walsh two button safety device and non-repeat attachment for the operator's protection can be furnished.

Use ACTION Card, opposite page 64, Encircle No. 40

New super-bond for diamond wheels

United States Diamond Wheel Co., Dept. B, 29 N. Broadway, Aurora Ill., has announced the release of its exclusive new Pressurelok-224 resinoid bond. Available now in all of U.S. Diamond Wheel's diamond grinding products for general distribution, PL-224 has been enthusiastically accepted in the aircraft, automotive, farm implement, electrical and tool industries where it has successfully withstood months of grueling on-the-job pre-marketing tests.

Pressurelok bonding is said to allow the diamond to be held securely and cut freely without hindrance from bond

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KLUTCH-KOLLET
Step collet for accurate chucking to 2¾" dia. Soft head for easy boring. Lowest price on market! Models 3AT, 3C, 5C.

FOR ATLAS • LOGAN • SOUTH BEND
CRAFTSMAN • SHELDON LATHES, ETC.

LEVER-TYPE DRAWBAR ½" cap.

Positive grip on undersize, oversize or standard diameter work! Patented coordinate cams eliminate fingers.

Let us quote on your quantity orders for any type of collet, live center or other machine tool attachment!

HAND DRAWBAR ½" cap.

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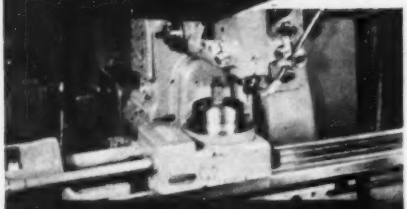

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Accurate Spacing, Powerful Clamping Insures Accuracy

Sundstrand Automatic Index Base

This automatic index base is designed so there is no strain against the index plunger during the cut. The base is locked by powerful clamping so that accuracy of index is not affected by heavy cuts.

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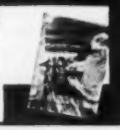
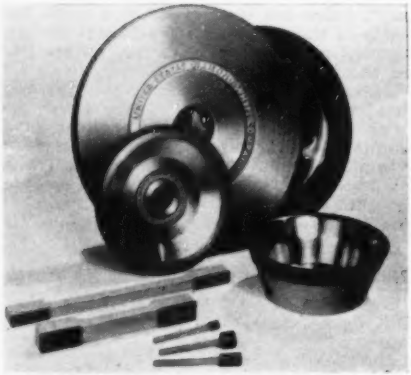
This 8 page booklet contains production figures and specifications. Send for your copy today. Ask for bulletin 446.



SUNDSTRAND

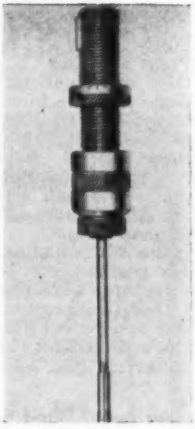
SUNDSTRAND MACHINE TOOL CO.
2535 Eleventh Street, Rockford, Ill., U.S.A.



smear. Diamond wheels made with PL-224 is said by the manufacturer to maintain shape better, cut faster and last longer.

Use ACTION Card, opposite page 64, Encircle No. 41

Lock-and-eject collet action for floating holders



Faster, easier replacement of tools, plus truer, more powerful collet action on taps and reamers are claimed as a result of a new "JT" lock-and-eject type floating holder announced by Scully-Jones and Co., Dept. B, 1901 S. Rockwell St., Chicago 8, Ill.

The new holder eliminates use of a drift when ejecting tools; four-split chucks for taps and two-split chucks for reamers are locked and ejected by means of a new threaded nut (revolving on ball bearings on nose of holder), which engages a thread on the end of the chuck. By rotating the threaded nut clockwise, chuck is drawn into the holder and compressed evenly and tightly on the shank of the tool. Opposite rotation unseats the chuck, permitting easy removal of tools. Chuck is quickly ejected by turning the lock and eject nut until threads are completely disengaged.

The holder is designed chiefly to compensate for misalignment between tool and work on multiple-spindle operations.

Use ACTION Card, opposite page 64, Encircle No. 42

AVAILABLE LITERATURE

FREE CATALOGS AND BULLETINS AVAILABLE FROM MANUFACTURERS

For copies of the literature in which you have an interest use the postage-paid postcard on the next page. Merely circle the identifying numbers and mail the postcard.

1. Step Tooth Milling Cutter. Circular sheet issued by the F & D Machine and Tool Works, Bridge St., Three Rivers, Mass., describes the manufacturer's step tooth milling cutter. Said to be a solid high-speed cutter which economically sets new standards of performance.

2. Hydraulic Straightening Presses, Broach Pull Heads. Circular No. 215, American Broach & Machine Co., Dept. BB, Ann Arbor, Mich., details American straightening presses in 15, 25, 35 and 50 ton capacities. Can be adapted to assembly, forcing, and testing operations. Booklet D-148 describes American broach pull heads, made for all sizes and types of broaching tools.

3. Lubrication. Three new leaflets of the Fiske Bros. Refining Co., Dept. BB, 129 Lockwood St., Newark 5, N.J., feature, respectively, C.S.A. 2 cutting oil for aluminum and all aluminum alloys; Magic Compound for milling, drilling, grinding, wire drawing, stamping; Empire engine oils for lubrication of stationary Diesel engines.

4. Drills. The Mohawk Sub-Land core drill, for machining a two-step cavity with four cutting edges for each dimension, is described and illustrated in literature issued by the manufacturer, Mohawk Tools Inc., Dept. BB, 910 E. Main St., Montpelier, Ohio. Sub-Land tools cut clean square steps and faces because of the overlapping blades.

5. Vernier Dials. Precision graduations of tool room quality enable operators to turn accurately to one ten thousandth with the Walenar vernier dial, according to flyer issued by the Walenar Engineering & Mfg. Co., 551 Concord St., Dept. B, Holliston, Mass. Four stop positions of the stop dial may be coordinated with multiple tooling of the cross-slide with little effort.

6. Copying Attachment. The Acc-U-Mat all hydraulic lathe copying attachment fits any lathe of 16″-24″ swing. Only 3½ oz. tracer pressure; duplicating tolerances within ±.0002″; standard models available in copying lengths up to 120″. Leaflet obtainable from Acc-U-Mat Machine Co., Dept. MB, 40 Exchange Pl., New York 5, N.Y.

7. Enclosure Guard. The Searjeant enclosure type adjustable milling machine guard has been designed to eliminate accidents due to the hazard of the exposed cutters. Circular sheet gives complete information. Searjeant Metal Products, Inc., Dept. MB, Mendon, N.Y.

8. Drill Press Turret. The Select-A-Spindle dual speed drill press turret, product of Commander Mfg. Co., 4225 W. Kinzie St., Chicago 24, Ill., is described in literature available from the company. Time saving claimed through the elimination of loading and unloading jigs, rehandling piece parts, etc.

9. Boring Heads. Bulletin No. 1049, Mummert-Dixon Co., 122 Philadelphia St., Hanover, Pa., has as its subject quick acting boring heads. All tool bits simultaneously adjusted, micrometer graduations, used with plain bar or tapered shank.

10. Oil Groovers. The Fischer Machine Co., Dept. B, 310 N. Eleventh St., Philadelphia, Pa., has made available a new oil groover booklet. Fischer oil groovers have all parts convenient for the operator to insure quick adjustment. Crank mechanism permits movement of carriage from zero to eight inches.

11. "Master Tools for Master Craftsmen," issued by Donovan Mfg. Co., Dept. BB, 80 Batterymarch St., Boston, Mass., covers the company's multi-swivel vises, platens, swivel platens, swivel bases, flanged vises, swivel vises. Multi-swivel vises are useful in shops where a great variety of work is encountered, i.e., producing angular pieces and forms, dies for sheet metal stamping, and other irregularly shaped pieces.

12. Swedish Lathes. Koping lathes, Types S8 and S10, are described, part by part, in new literature being distributed by the U. S. representative, Mattsson Machinery, Inc., Dept. BB, 19 Greenwood Ave., Montclair, N.J. Features: two disc clutches, 18 spindle speeds, arrangements in headstock for large leads up to 8″ per spindle revolution, feed gear box has 40 feeds and threads without change of gears.

13. Drilling Machines. Two booklets, one featuring their high speed drill press, Model 105, and the other, the new Electro-Mechano wide range variable speed 16″ drilling machines, for drilling, reaming, spot facing, tapping, conuterboring, are available from the Electro-Mechano Co., 263 E. D'Eire St., Milwaukee 2, Wis.

14. Mist Control. New literature shows how mist from a group of centerless grinders is controlled by individual unit type Dustkop vapor collectors which are suspended from ceiling. Available from Aget-Detroit Co., Dept. B, 205 Main St., Ann Arbor, Mich. Ask for Bulletin 640 No. 3.

15. Vertical Milling Head. Booklet issued by the Brown Vertical Milling Head Co., Dept. BB, 1615 Riverside Dr., Los Angeles 31, Calif., portrays the 25 models and sizes of the company's vertical milling head. Exclusive design high-low plane milling feature on universal models.

16. Universal Tool Grinding Machines. Bulletin 10-1158-E, Nife Inc., Dept. MB, Lambert Ave., Copiague, Long Island, N.Y., describes Swedish-made Jungner tools. Universal tool grinders are designed so that the economic and technical advantages of the counter-grinding principle can be realized for virtually all kinds of cutting tools.

17. Surface Treatment. "The Ransohoff Story" affords a picture and word visit with N. Ransohoff Inc., Dept. BB, North Fifth St. and Ford Blvd., Hamilton, Ohio. Profusely illustrated with photographs of the plant, its personnel, and products.

18. Stud Stamping Machine. Bulletin 446, issued by Geo. T. Schmidt, Inc., Dept. MB, 1802 Belle Plaine Ave., Chicago 13, Ill., describes the company's pneumatic stud stamping machine designed for end stamping studs, shafts and other long components up to 20″ in length.

19. Heavy-Duty Coater. Flyer of L. R. Wallace & Co., Dept. BB, 191 N. Pasadena Ave., Pasadena 3, Calif., illustrates and describes the new heavy-duty Walco coater, for applying adhesives, paints, enamels, oils and other coating materials to metals, masonite, plywood, paper products, fabrics and other flat surfaces.

20. Production Tools, Catalog just published by Errington Mechanical Laboratories, Inc., Dept. B, Staten Island 4, N.Y., shows the complete line of the company's production tools, including tappers, drilling heads, tool holders, nut setters, stud setters, etc.

21. Tapping Machine. Newest literature issued by the Hamilton Tool Co., Dept. B, Hamilton, Ohio, illustrates and describes their precision small hole tapping machine. A number of changes have been made in the machine since the last tapping machine bulletin was published in 1947.

22. "Talide Rolling Mill Work Rolls," Bulletin No. TB-3, includes a description of the difference between Grade A and Grade B rolls, as well as a list of types of strip steel that can be satisfactorily

rolled with Grade B rolls and types of strip steel which require Grade A rolls to obtain the proper finish. The Metal Carbides Corp., Dept. B, Youngstown, Ohio.

23. Horizontal Shaving Machines. A new 16-page illustrated catalog, No. S-54-2, describing Red Ring horizontal shaving machines for large external gears is available from National Broach & Machine Co., Dept. MB, 5600 St. Jean, Detroit 13, Mich. Concise operating descriptions and application information are included.

24. Automatic Turret Lathe. Bulletin No. 123 on the P&J 5-D2 Power-Flex automatic turret lathe will be sent by Potter & Johnston Co., Dept. B, Pawtucket, R.I. Features are: four automatic changes of spindle speed while under cut, three selective automatic changes of feed, automatic binding of the turret following index.

25. Turret Lathe Center. Information on the Red-E turret lathe center, as well as the complete line of bull and pipe nose type centers, is furnished in the recently published catalog of the Ready Tool Co., 550-B Iranistan Ave., Bridgeport, Conn. Center sizes range from 1½" to 2½" shank diameter with head sizes from 2⅞" to 5⅛".

26. Federal Finances. Copies of the first two sections of a report entitled "Federal Finances" have been released by the Committee on Federal Tax Policy, Dept. B, 50 W. 50th St., New York 20, N.Y. Part 1 discusses the problem, and Part 2, reducing expenditures. A third section on taxes will be issued soon.

27. Selective Feeding Devices. A discourse on advantages of automation, and descriptions of the manufacturer's barrel feeder and bowl feeder are contained in booklet issued by the Detroit Power Screwdriver Co., Dept. MB, 2801 W. Fort St., Detroit 16, Mich. Tells how systematized production increases profits. Also available is special bowl feeder bulletin.

28. 3-D Binocular Magnifier. Brochure of the Edroy Products Co., Dept. 14, 480 Lexington Ave., New York 17, N.Y., shows on-the-job photos of the use of the Magni-Focuser, the new 3-D binocular magnifier claimed to promote accuracy on all precision work.

29. Power Units, Counterbores. The Ex-Cell-O Corp., 1212 Oakman Blvd., has released two new bulletins made to fit the Ex-Cell-O complete catalog binder. Bulletin 45040 features the quill type hydraulic power units Styles 22 and 22-L, and Bulletin 60446 covers standard Continental counterbores, holders, cutters, countersinks, pilots, and counterbore sets.

30. Multiple Nut Runners. Air powered for speed and accuracy, I-R multiple nut runners, Ingersoll-Rand, Dept. MTB, 11 Broadway, New York 4, N.Y., drive two to ten nuts or more simultaneously. Torque is uniform on each nut. Write for Bulletin 5099A.

31. Machining Stainless Steel Bars. Thumb-indexed handbook issued by the Republic Steel Corp., Dept. BB, Advertising Div., 3100 E. 45th St., Cleveland 1, Ohio,, contains data and information to aid stainless steel users in obtaining the best results when machining Republic Enduro stainless steel. Gives basic principles, ways to correct machining troubles, etc.

32. Accessories and Components for tool rooms and machine designers are catalogued in newest book of the Reid Tool Supply Co., 334 W. Delano Ave., Muskegon Hgts., Mich. Write on your letterhead for free copy.

33. Perforated Sheets and Plates. Newly published 4-page bulletin illustrates perforated patterns available from stock, and other patterns supplied to order from carbon and stainless steel sheets and plates. For safety, ornamental and screening purposes, and for manufactured articles. Joseph T. Ryerson & Son, Inc., Dept. B, P.O. Box 8000-A, Chicago 80, Ill.

34. Masonry Cutting Blades, Snagging Wheels. Two leaflets, one dealing with masonry cutting blades for wet or dry cutting applications, and the other with snagging wheels for portable grinders, have been issued by the Allison Co., Island Brook, Bridgeport, Conn.

35. Boring Machine. The Unimatic precision boring machine, Atlantic Instrument Corp., Dept. MB, Norwood, Mass., features repeatability to .0002" under normal working conditions. Complete automatic operation. Folder and price list available from manufacturer upon request.

36. Hydraulic Cylinders. Custom built BHEW hydraulic cylinders perform many tasks: reciprocate, clamp, hold, turn,

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squeeze, lift, swing, tilt, lower, eject. Booklet describing applications is obtainable from Benton Harbor Engineering Works, Inc., Dept. B, Benton Harbor, Mich.

37. Drill Grinder. The Black Diamond Saw & Machine Wks., Inc., Dept. B, North Ave., Natick, Mass., has made available a leaflet covering the Black Diamond precision drill grinder for small drills. Four easy steps in grinder's operation are illustrated and detailed.

38. Modernization of Double Crank Presses. E. W. Bliss Co., Dept. BB, Canton, Ohio, has issued a 16-page brochure containing recommendations for the modernization and conversion of straight-side and gap-frame double crank presses.

39. Dial Gages. Bulletin 454, Boice Mfg. Co., Inc., Dept. MB, describes large diameter gages, length gages, and adjustable setmasters. Adjustable dial indicator comparators are designed to eliminate the necessity of replacing gaging equipment when dimensional changes are made during production.

40. "Cerro Alloys in the Pattern Shop," an 8-page technical bulletin released by Cerro de Pasco Corp., Dept. A, 40 Wall St., New York 5, N.Y., contains information regarding the making of duplicates of wood patterns in the construction of aluminum matchplates. Included is a description of a novel method of anchoring phenolic plastic, metal or wood patterns in matchplates.

41. Automatic Screw Machines. A new bulletin issued by the Cleveland Automatic Machine Co., 4934 Beech St., Cincinnati 12, Ohio, illustrates and describes the various sizes and models of Cleveland single spindle automatic screw machines. Easily changed pick-off gears offer wide speed range, both forward and reverse.

42. Precision Chucks, air operated or manual, are described in leaflet distributed by the Stace national sales representative, Crodian & Co., Dept. B, 4897 Kessler Blvd., East Drive, Indianapolis 22, Ind. Features claimed: extreme simplicity and fewer working parts. Price list included with leaftlet.

43. Pressure Blasting Process. The Cro-Plate Co., Inc., Dept. MB, Hartford, Conn., has published a booklet describing in detail its regular velocity and high velocity pressure blasting process and its applications in deburring, cleaning, scale removal, etc.

44. Die Sets. Profusely illustrated with photographs of the manufacture of Danly die sets, the new booklet issued by Danly Machine Specialties, Inc., Dept. BB, 2100 S. Laramie Ave., Chicago 50, Ill., comprehensively tells the story of the manufacturer's product in few words.

45. Metal Stampings. Brochure describing their small lot stamping service has been released by Dayton Rogers Mfg. Co., Dept. B, Minneapolis 7, Minn. Maximum blank size: 22 x 22; maximum thickness: $\frac{3}{8}$"; maximum blanking pressure: 225 tons.

46. Toggle Clamps. Two flyers published by the Detroit Stamping Co., 347 Midland Ave., Detroit 3, Mich., are available for distribution. Bulletin 101 describes the toggle thrust clamp, Model 101, and Bulletin 435 covers the multiple purpose toggle clamp, Models 435 and 435P.

47. Hydraulic Chucks. Said to have optimum gripping power which insures tremendous cutting capacity at unlimited spindle speeds, the Burnerd Powergrip hydraulic chucks are described in leaflet published by the De Witt Equipment Corp., Dept. BB, 136 Lafayette St., New York 13, N.Y.

48. Die Springs. Brochure released by the Die Supply Co., Dept. B, 1400 Brookpark Rd., Cleveland 9, Ohio, illustrates the following features of Die-Co die springs: 500 standard sizes; special metallurgical compounding; oval spring wire; shot peening added to steel processing.

49. Roto-Head. Booklet describing the Roto-Head, said to make one lathe do the work of ten, is available from General Roto Co., Dept. MB, 847 E. 60th St., Los Angeles 1, Calif. Fits lathes from 9" to 12" swing. Handles any work length within lathe capacity. Turns up to 16 diameters consecutively on any workpiece.

50. Ball and Roller Bearings. Catalog No. 27, The Gwilliam Co., Dept. BB, 360 Furman St., Brooklyn 2, N.Y., catalogs the products of the company: roller thrust bearings, ball thrust bearings, ball thrust step bearings, thrust bearings, journal

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roller bearings, industrial roller bearings, metal balls, steel rolls, special bearings.

51. Engraver. The Model 106 Green engraver, Green Instrument Co., Inc., Dept. B, 385 Putnam Ave., Cambridge, Mass., engraves on steel, brass, aluminum, stainless steel, bronze, plastic, wood, hard rubber, glass. Bulletin 14106 and price list available from manufacturer.

52. Metal Cutting. Savings in metal cutting effected through the use of the Little Wonder Nibbler, 14 gage, are claimed by the manufacturer, Fenway Machine Sales Co., Inc., Dept. B, 263 N. 23rd St., Philadelphia 3, Pa. Flyer obtainable upon request.

53. Files. Heller Swiss-Pattern files, for precision work, are subject of brochure distributed by Heller Bros. Co., Heller Dr., Newcomerstown, Ohio. Files are narrow in both width and thickness and the tapered files have fine points. Teeth extend to extreme edges.

54. Maintenance of Air and Hydraulic Equipment. Publication of a new pocket-size manual entitled "The ABC's on Maintenance of Air and Hydraulic Equipment" has been announced by Logansport Machine Co., Inc., 803 Center Ave., Logansport, Ind. The booklet deals with its subject in cartoon style, and through a more or less exaggerated approach.

55. Precision Tools. Catalog and price list of precision tools, extra long drive pin punches, big barrel micrometers, magnetic tools, are available from the Lufkin Rule Co., 1734 Hess St., Saginaw, Mich. Carbide tipped micrometers are obtainable in sizes from ½" through 12". Also available, humorously illustrated booklet, "Micrometer Reading Made Easy."

56. End Mills. Melin Tool Co., Inc., Dept. BB, 3370 W. 140th St., Cleveland 11, Ohio, has available their new No. 54-C catalog covering the company's complete line of end mills, router bits, countersinks, counterbores, corner rounding tools, live centers and special tools.

57. Tool Shape Identification Chart. An unusual carbide and abrasive tool shape identification chart is obtainable from the Metal Removal Co., Dept. BB, 1546 N. Orleans St., Chicago 10, Ill. Illustrated in actual size are the various shapes of the company's mounted points. Carbide burr shapes are also illustrated, with dimensions and prices listed as for the mounted points.

58. Precision Balancing. A bulletin detailing the use of their automatics to attain precision balancing by metal removal is obtainable from the Motch & Merryweather Machinery Co., Dept. MB, Penton Building, Cleveland 13, Ohio. For automatically weight-balancing automo-

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tive pistons, shell forgings, cold extrusion slugs, etc.

59. "The Case Against Secondary Boycotts," a concise booklet which details pertinent facts of the subject, has been issued by the National Electrical Manufacturers Association, Dept. B, 155 E. 44th St., New York 17, N.Y. Includes summary of boycott faults and lists loopholes in Taft-Hartley boycott protection.

60. Precision Screw Machine Products. A comprehensive brochure covering the manufacture of their bolts, manifold coupling, valve rocker shaft, push rod adaptor, etc., has been released by The New Britain Machine Co., Dept. BB, New Britain, Conn. Answers many questions about the plant and its products.

61. Precision Indicator Gauge. A booklet illustrating the various models of Smith precision indicator gauge, an English import, is being distributed by Ovee Gauge Co., Dept. B, 2516 W. Vernon Ave., Los Angeles 8, Calif.

62. Speed Indexers. A folder describing their line of speed indexers has been announced by Erickson Tool Co., 2321 E. Hamilton Ave., Cleveland 14, Ohio. Model No. 450 rotary indexing table is designed for use in a vertical position where limited height is a factor.

63. Tube Fabricating Machinery. No. 17 of the "Pines Engineering News," published by Pines Engineering Co., Inc., 699 Walnut St., Aurora, Ill., is available upon request. Details applications involving smooth extra sharp bends in ultra-thin tubing.

64. Automatic Screw Machine. A bulletin giving details on the new Porter-McLeod Double-Matic single spindle automatic screw machine is available from Porter-McLeod Machine Tool Co., Inc., Dept. BB, Hatfield, Mass. Both the front and back ends of workpieces can be machined in a single cycle.

65. Direct Reading Dresser. A colorful booklet covering the Tangi-Matic direct reading dresser for angle tangent to radius wheel dressing has been released by Perfex Gage & Tool Co., Dept. B, 123 Avery St., Mt. Clemens, Mich. Also included is information on the Grind-A-Matic attachment which combines the high speed air spindle and Perfex method of increasing the diameter of the cut without stopping the spindle.

66. Pivot Punch Services. A well-designed catalog of products and services has been issued by Pivot Punch & Die Corp., Dept. MT, North Tonawanda, N.Y. Included are sections on punches, tools and dies, special machinery, jigs and fixtures, fabrication,

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52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68
69	70	71	72	73	74	75	76									

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gages, machinery repair and rebuilding, subcontracting.

67. Surface Grinder, Wheel Forming Attachment. Two booklets have been issued by Pratt & Whitney, 22 Charter Oak Blvd., West Hartford 1, Conn. Circular No. 569 features the Model D 14″ hydraulic vertical surface grinder, offering higher table speeds, centralized control, uniform table traverse. Circular No. 572 covers the DiaForm wheel forming attachment for form-truing complex and irregular shapes up to 2″ wide and 1″ deep.

68. Grinder-Millers, Power Quills. A new general catalog covering their complete line of precision built, portable electric grinder-millers, power quills, machine tool mounts and accessories is being distributed by Precise Products Corp., 1350 Clark St., Racine, Wis.

69. Band Saw. Variable speed drive, 50 to 4500 sfpm are features described in folder of Walker-Turner Co., Dept. B, Plainfield, N.J., pertaining to the Walker-Turner light-heavyweight 16″ band saw. Cuts tough steels, nonferrous metals, plastics, compositions or wood.

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70. Tap Chamfer Grinder. New descriptive literature issued by Edward Blake Co., Dept. MB, 437 Cherry St., West Newton 65, Mass., is illustrated with close-up photos of the company's tap chamfer grinder, Models 1 and 2. Taps may be sharpened for re-use.

71. Broaching Machine. Special surface-broaching installations of the Ram-Press broaching machine line are featured in a 4-page bulletin released by the Colonial Broach Co., Dept. BB, P.O. Box 37, Harper Station, Detroit 13, Mich.

72. Comparator, Vernier Caliper. New literature of the George Scherr Co., 200 MTD Lafayette St., New York 12, N.Y., describes, respectively, a new model of toolmakers' vernier caliper with a combination of automatic camlock and fine adjustment screw, and the Millimess amplifying comparator for all purposes where extreme accuracy is required. Comparator can be built into any existing fixture, holder or stand.

73. Precision Flat and Roller Lapping Machines. A new 6-page bulletin released by

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Detroit thread plug and thread ring gages have long been noted for their high degree of accuracy and long life.

Now, in addition to accuracy and quality, Detroit Tap and Tool can make prompt delivery on Standard American National thread gages as well as on gages for Unified threads, American Standard pipe threads, Aeronautical pipe threads or Dryseal pipe threads.

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Spitfire Tools Co., Dept. B, 2931 N. Pulaski Rd., Chicago 41, Ill., gives information and specifications of their precision flat lapping and roller lapping machines. Flat-lapping Model No. N.P.1795-24 has a 24" revolving lapping plate with grooved Archimedean spiral.

74. Wrenches. New catalog of Stevens Walden, Inc., Dept. BB, Worcester, Mass., lists the company's complete line of socket wrenches, open end wrenches, box wrenches, Spintite wrenches, automotive tools, screwdrivers, aircraft tools, metal boxes, hammer heads, impact sockets, etc.

75. Automatic News. New issue of Automatic News, published by Greenlee Bros. & Co., 1840 Mason Ave., describes magazine loading arrangement on Greenlee second operation machine. Facilitates the loading of a long, irregularly shaped shaft into the first position collet.

76. Drill Chucks, Tapping Devices. Multiple tapping and drilling heads, and tapping machines are covered in loose-leaf booklet of Ettco Tool Co., Inc., Dept. BB, 594 Johnson Ave., Brooklyn, N.Y. Price lists are included.

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AGENTS

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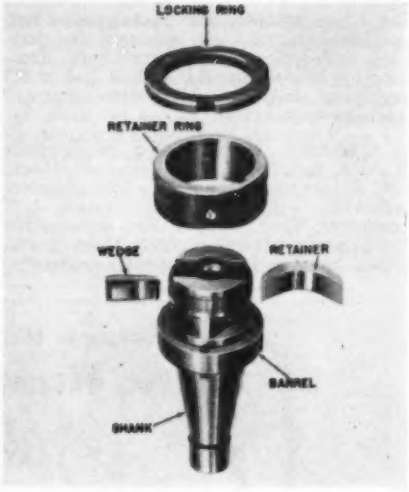
Detroit Reamer Wej-Lok tool holder

Detroit Reamer's Wej-Lok tool holder barrel, of one piece construction, is said to be accurately machined to not only hold cutting tools but also the several holder parts that prevent the tools from turning or coming out once they are locked in place. The rectangular wedge is located in the head portion of the holder where it is moved back and forth in its channel by the retainer to either lock or unlock inserted tools. A keyed interlocking of retainer and knurled retainer ring causes these two parts to operate as a single unit. Thus, when retainer ring is revolved, the retainer is simultaneously actuated and strikes the wedge to move it either to locking or unlocking position.

In locked position, the flat surface of the wedge is firmly seated in the mating notched section on shank of inserted tool. Also, normal torque of tool in operation will always tend to tighten this wedging action and more firmly lock the tool. An additional safety factor is the locking ring which prevents the retainer ring turning loose due to vibration.



Ordinarily, locking and unlocking of Wej-Lok holders are done by hand. However, if locking ring should be tightened excessively, it can be readily released by

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using a standard spanner wrench.

Both left and right-hand cutting tools can be used in the Wej-Lok holder.

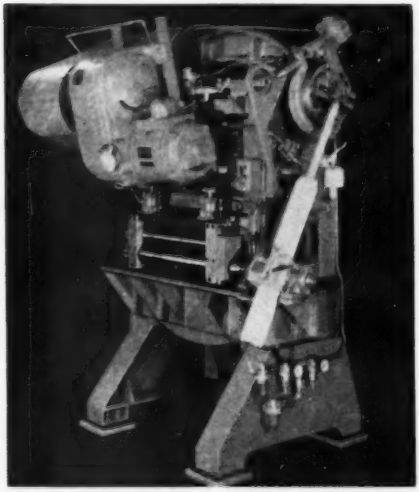
The slot in the face of the Wej-Lok holder permits the use of Baker drive on larger tools or where unusually heavy cutting operations are employed. By augmenting the wedge locking of tools with the Baker drive, torque stresses are distributed over the larger diameter of the holder face to further assure utmost stability and elimination of play. Detroit Reamer & Tool Co., Dept. B, 2830 E. Seven Mile Rd., Detroit 34, Mich.

Use ACTION Card, opposite page 64. Encircle No. 51

Diebel 40-ton automatic press 28½" between uprights

Stamp up to 23" wide stock on this new Diebel 40-ton automatic press with back-to-front feed, use of air cylinders to clamp stock is claimed to assure positive feeding without distortion of soft metals. Length of feed infinitely variable from zero to thirteen inches.

Press features cylindrical-type ram for punch and die alignment. Four bronze bearings support the crankshaft for maximum strength and shaft rigidity. Use of pneumatic clutch in conjunction with



variable-speed motor permits press operation from 72 to 360 strokes per minute. Di Machine Corp., 2701 W. Irving Park Rd., Chicago 18, Ill.

Use ACTION Card, opposite page 64. Encircle No. 52

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and
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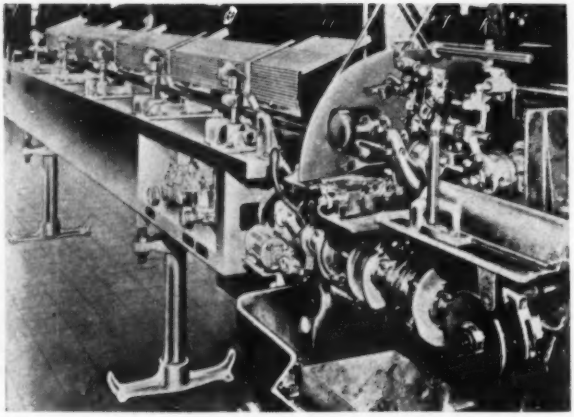
AML pneumatic bar feed has new applications



This automatic magazine loading pneumatic bar feed, manufactured and designed by Lipe-Rollway Corp., 806 Emerson Ave., Syracuse, N. Y., for use with Brown and Sharpe automatic screw machines, now is applicable also to abrasive saws, cut-off machines, punch presses and centerless grinders.

Said to be capable of increasing B & S production output by 50% the feed eliminates frequent loadings by hand and feeds bar stock continuously for periods up to eight hours or more. It is actuated by air valves and cylinders. Bar stock is racked in a magazine along one side of a split stock bar tube, the lower half of which slides backward to receive the bottom bar stock from the magazine. Then, the lower half of the stock bar tube, carrying the bar, moves forward to close the stock bar tube. A stock pusher, inside this tube, moves the bar into the spindle and collet of the automatic screw machine. Regardless of model, the magazine capacity of stock bars 12-feet long or less is from 19⅝" dia. to 96⅛".

Use ACTION Card, opposite page 64. Encircle No. 45

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and SHEET METAL

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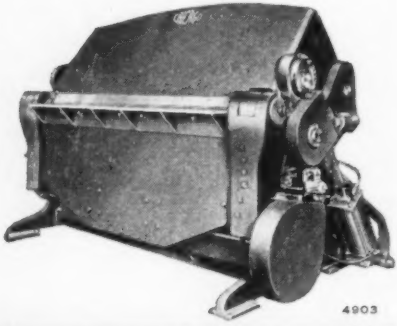
Double Folder Brakes



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DREIS & KRUMP
MANUFACTURING COMPANY
7440 S. Loomis Boulevard, Chicago 36, Illinois

CHICAGO
STEEL BENDING BRAKES
BOX and PAN BRAKES
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Look for the **RED BAND**

You no longer have to guess whether you are overloading your live center thrust bearings if you use MOTOR TOOL LIVE CENTERS. When the load is too great the RED BAND around the spindle disappears into the housing. You can see at a glance when overloading occurs. This is an exclusive feature, developed by Motor Tool which cuts repair costs to practically nothing if due diligence is exercised. As long as the RED BAND is visible you are running COOL and SAFE.

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N E W descriptive folder . . . and *verified* case histories of how MOTOR TOOL LIVE CENTERS have *out-performed* and *outlasted* ALL other centers on exceedingly tough, continuous-run jobs.

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New Method Makes Higher Quality Marking Devices

Use of highest quality tool steel and carefully controlled heat treatment in the production of all types of marking devices including steel stamps, inspector's code symbol stamps, embossing dies, marking hammers and roll dies increases life of the devices and reduces overall cost to the user.

The complete line of these steel marking devices is described in Catalog NM-51, available on company letterhead from New Method Steel Stamps, Inc., 147 Jos. Campau, Detroit 7, Michigan. Also described and illustrated are type holders and interchangeable type, automatic roll markers for screw machines, logotypes, etc.

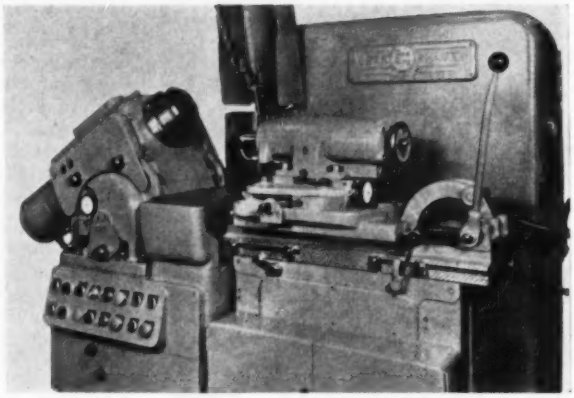
New Method Steel Stamps also maintains complete facilities for production marking, precision engraving and profiling.

marking devices
steel stamps . . . . . pp. 6 and 7
type holders . . . . . pp. 2 and 3
automatic roll markers . p. 4
roll dies . . . . . p. 5
solid stamps . . . . . p. 5
embossing dies . . . . . p. 5
logotypes . . . . . p. 5
marking hammers . . . p. 5
production marking . . p. 8
precision engraving . . p. 8
profiling . . . . . p. 8
NEW METHOD STEEL STAMPS, INC.

Free 12 page illustrated catalog describes complete line of marking devices and facilities for production marking, precision engraving and profiling. Available on company letterhead from New Method Steel Stamps, Inc., 147 Jos. Campau, Detroit 7, Michigan.

Gear shaving machine for internal spur or helical gears from 3 to 12-in. pitch diameter

A new Red Ring gear shaving machine for precision shaving operations on internal spur and helical gears from 3" to 12" pitch diameter is announced by National Broach & Machine Co., Dept. B, 5600 St. Jean Ave., Detroit 13, Mich.



Designated as the Model GCR, it is designed specifically to finish only internal gears. Gears having up to four diametral pitch teeth and face widths up to 2½" can be shaved.

Among the design features are: 1. Workhead that permits taper shaving operations with an optional pivoting feature, that facilitates loading and unloading of internal gears such as those having wide faces or integral long shafts; 2. Precision differential automatic upfeed mechanism which includes a master cam that acts as a step gaging device to accurately control feed increments, finished size, and return to backlash position; 3. Optional high production plunge-cut

HIGH SPEED PRODUCTION
CONTINUOUS OIL GROOVING

WICACO CONTINUOUS OIL GROOVER cuts grooves of all descriptions, internal or external, continuous or intermittent.

Send us samples for grooving. We will return them cut to specifications, with a record of time and cost estimate. No obligation.

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Manufacturers of
Precision Machinery and Machine Parts
Roller Bearing Twister Spindles—Spindle Oiling Machine
Screw Machine Products

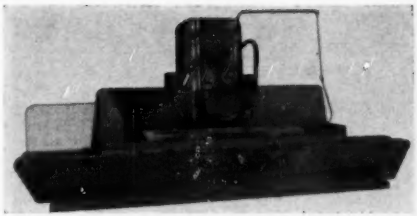
shaving (cutter feed without work or cutter reciprocation); 4. Design that avoids suspension mounting of principal machine elements, thereby reducing deflections and providing maximum rigidity and precision; 5. Centralized pushbutton controls for both setup and operation.

Use ACTION Card, opposite page 64. Encircle No. 46

Grand Rapids high speed production type surface grinder announced by Gallmeyer & Livingston

This new hydraulic feed, cross traveling head surface grinder is 24″x25″x96″; spindle powered by 30 h.p. motor, giving 6000 s.f.p.m. speed with 20″ diameter wheel. Hydraulic drive motor 15 hp.

Features include: Base rugged, one-piece casting; upright column which carries the vertically traveling head is one-piece casting for greatest rigidity; table speed varies from practically nothing to 150 fpm; table actuated through Vickers tandem pump; one shot lubricating system; conveniently located control panel features oilproof push buttons; hydraulic oil reservoir located outside of machine for maximum convenience, with no sacrifice of floor space;



self-contained motor-driven coolant system standard equipment.

Many accessory combinations are available such as built-in diamond wheel truing device, magnetic chucks, automatic down feed. Gallmeyer & Livingston, Dept. B, Grand Rapids 4, Mich.

Use ACTION Card, opposite page 64. Encircle No. 47

Delpark filters designed into new Norton grinder

Engineers for Norton, have incorporated into the base of their newest grinder the Delpark coolant filters. The machine is the Norton Type CM-1 heavy duty semi-automatic multi-wheel grinder. This unit utilizes several grinding wheels mounted between bearings for simultaneously

IMMEDIATE DELIVERY from STOCK

STANDARD CIRCULAR FORM TOOL BLANKS

(Made of High Speed Steel) Soft or Hardened

Width	No. 00 B. & S. Soft	No. 00 B. & S. Hardened	No. 0 B. & S. Soft	No. 0 B. & S. Hardened	No. 2 B. & S. Soft	No. 2 B. & S. Hardened
1/4"	$1.00	$1.50				
5/16"	1.10	1.60	$1.75	$2.20		
3/8"	1.20	1.70	1.90	2.40	$2.80	$3.50
7/16"	1.30	1.80	2.05	2.60	3.00	3.85
1/2"	1.40	2.00	2.20	2.80	3.20	4.20
9/16"	1.50	2.20	2.35	3.05	3.45	4.50
5/8"	1.65	2.40	2.50	3.30	3.70	4.90
11/16"	1.80	2.60	2.65	3.55	4.00	5.40
3/4"	2.00	2.80	2.80	3.80	4.30	5.80
13/16"	2.20	3.00	2.95	4.00	4.60	6.20
7/8"	2.40	3.20	3.15	4.20	4.90	6.60
15/16"	2.60	3.60	3.30	4.40	5.20	7.00
1"	2.80	3.80	3.45	4.70	5.50	7.40
1- 1/16"			3.60	5.10	5.85	8.00
1- 1/8"			3.75	5.50	6.20	8.60
1- 3/16"					6.60	9.20
1- 1/4"					7.00	9.80

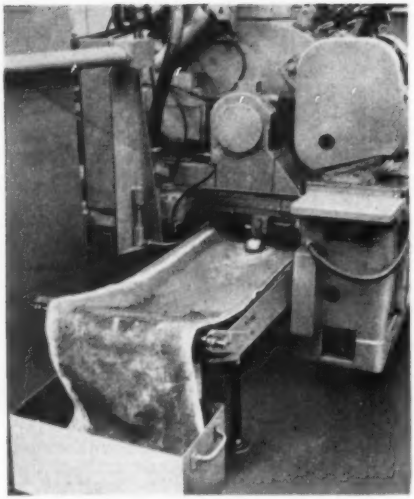
Also, prices on request for Blanks for other make machines or for Blanks made of HIGH COBALT STEEL.

Send for COMPLETE STANDARD TOOL CATALOG

SOMMA TOOL CO., INC.

21 BROWN ST. WATERBURY, CONN.

West Coast Warehouse:
576 No. Prairie, Hawthorne, Calif.



grinding different diameters on the work piece in a single plunge-grind operation. The high sludge load produced by these multiple grinding wheels is immediately removed from the coolant supply, constantly keeping it clean and free of particles which would spoil the finish of the ground work.

Delpark coolant filter applies a new principle in the filtration of coolants. It is a continuous, self-cleaning gravity filter. Solids are filtered from liquids that will flow, by gravity, through filter material and discharges the solids, in a relatively dry state, into an outside container. Industrial Filtration Co., Dept. N-290, Lebanon, Ind.

Use ACTION CARD, opposite page 64. Encircle No. 48

Electric grinding gage provides automatic size control for cylindrical grinders

A new electric grinding gage, said to contain many design improvements, is now being manufactured by Federal Products Corp., Dept. B, 1144 Eddy St., Providence, R.I.

This gage (Model 133M Series) is made up of the Arnold grinding gage frame and caliper with a Federal Electricator instead of the regular dial indicator, plus a power or control unit. The electricator is basically a dial indicator combined

Dependable MEASURING & CHECKING EQUIPMENT

and Now

HAND WHEELS, KNOBS, HANDLES

Cadmium Plated READY TO DELIVER

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In 10 sizes, ranging from 4 x 3¾ x 5 and up.

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In 15 sizes, ranging from 3 x 4 x 12 and up.

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In 19 sizes, ranging from 4 x 9 x 5 and up.

SURFACE PLATES
Over 50 sizes, ranging from 7 x 7½ to 96 x 192.

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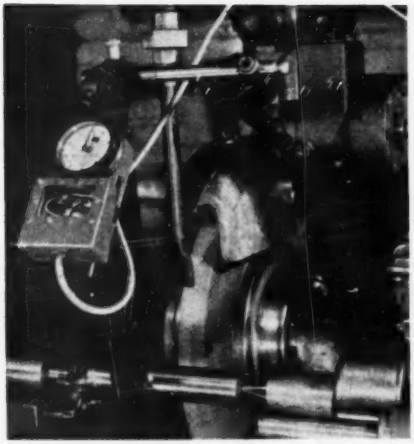
6771 E. McNichols Rd. Dept. A Detroit 12, Mich.



with an electric switch which is connected directly to the power unit.

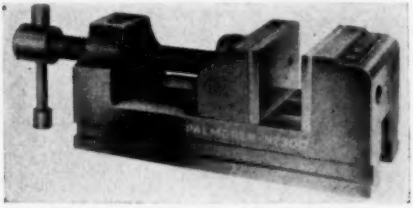
With an electric grinding gage, the operator needn't stop grinding to gage the work for size. Automatic control of the grinder begins as soon as the gage is snapped on the work.

Use ACTION Card, opposite page 64. Encircle No. 49

New drill press vise

The new Palmgren No. 300 drill press vise has jaws 3" wide, opens 3", depth of jaws 1¾". This vise has removable steel jaw plates and a heavy Acme thread adjusting screw. Machined slots are provided on either side of the vise to aid in clamping it to the machine table.

The No. 300 is recommended for use on drill presses, milling machines, grinders and other machines. It is machined square



on all sides and may be turned on either side, end or upside down for special operations. Accurately machined of semi-steel grey iron castings. Chicago Tool and Engineering Co., Dept. MB, 8383 South Chicago Ave., Chicago 17, Ill.

Use ACTION Card, opposite page 64. Encircle No. 50

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ARBOR PRESSES

For Assembling
Keyway Cutting
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And many other jobs

65 Standard styles and sizes

From ¼ to 20 tons pressure for manually operated presses

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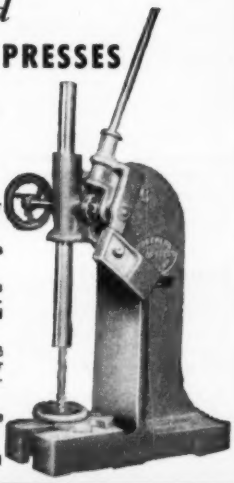

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BORE HOLES

Also other polynominal profiles—male or female—with taper if required. Less than .020" corner radius; ±.0005" accuracy. For special shapes templates of ¼" nylon can be machined in 15 minutes and re-useable whenever needed. Costly hours reduced to mere minutes with Alina Profile-Boring Head.

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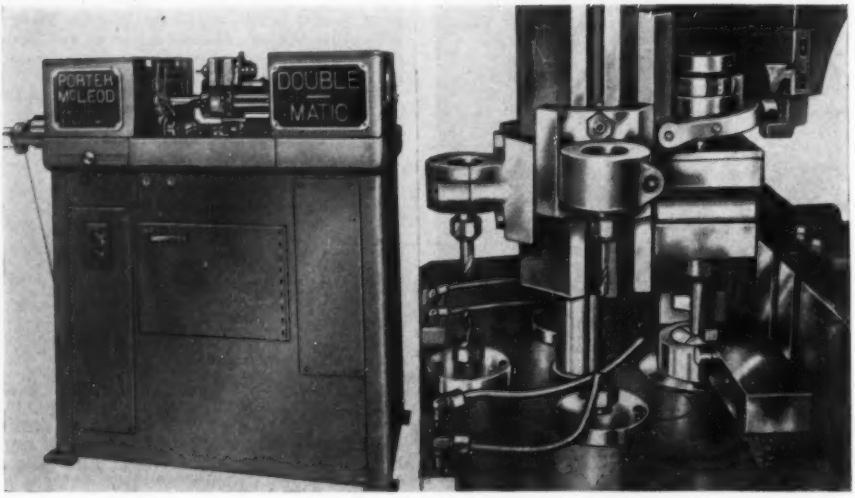
Double-Matic screw machine finishes front and back of work pieces in one cycle



Porter-McLeod Machine Tool Co., Inc., Dept. B, Hatfield, Mass., manufacturers of precision machine tools, announces the introduction of a Double-Matic screw machine which machines both the front and back of work pieces in one complete cycle. The Double-Matic is said to completely eliminate the need for second operation machines by performing additional work after cut-off.

The Double-Matic utilizes a tool holding turret revolving on an axis parallel to the spindle. As with other screw machines the stock is fed through, clamped and machined on the front side. However, the final turret position is occupied by a live spindle which contains a collet and runs at the same speed as the main drive spindle. This live spindle grips the work piece, supports it during cut-off and continues to hold it. Then, while turret tools machine the next piece, the back end is machined by tools mounted on the headstock.

Almost any operation—drilling, reaming, tapping, threading, forming or chamfering—can be performed as easily on the back end as on the front.

Use ACTION Card, opposite page 64. Encircle No. 43

Carboloy's two new carbide grades boost output

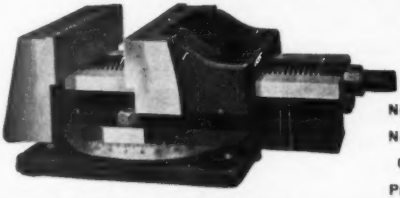
The addition of standard tools and blanks in new cemented carbide grades 350 and 370 is announced by Carboloy Department of General Electric Co., Dept. B, Detroit 32, Mich.

Grade 350 was developed for light roughing and general finishing of steel. Grade 370 is for heavy-duty steel cutting applications.

The 350 is a medium-duty, high wear-resistant steel cutting grade cemented carbide which is said to provide up to 30% better performance. The new material, with its unique grain structure, extends the machining range of the new series to another area—to withstand cutting temperatures as high as 1800°F.

One of the more than 10 companies testing the new grade 350, on an axle shaft, for example, jumped the number of units machined per grind better than a third. Another company machining a torque strut for a landing gear found that the new grade increased tool life by a ratio of 6 to 1. Here too, the steel was not particularly difficult to cut, but

SUPERIOR QUALITY AND WORKMANSHIP IN PLUNKET VISES



SQUARE BASE SHAPER VISE

The Shaper Vise has graduated swivel base and tongue in center to fit slot in table, and has holes for bolting down. In ordering this vise give size of slots in Shaper Table, also distance from center to center of slots.

No. 40, 10" jaws, 2¼" deep, opens 8½". Weight 125 lbs. **$110.88**

No. 4, 6" jaws, 1½" deep, opens 5". Weight 45 lbs. ..... **$ 81.84**

Our complete line includes Vises for Drill Presses, Milling Machines, Shapers and Grinders.

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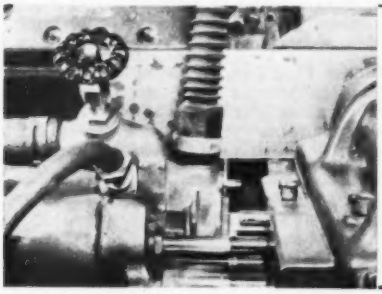

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SAVE TIME DIAMONDS MONEY

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- 2 GRADUATIONS - 1/1000" - 1/128" - 1/10 mm in back

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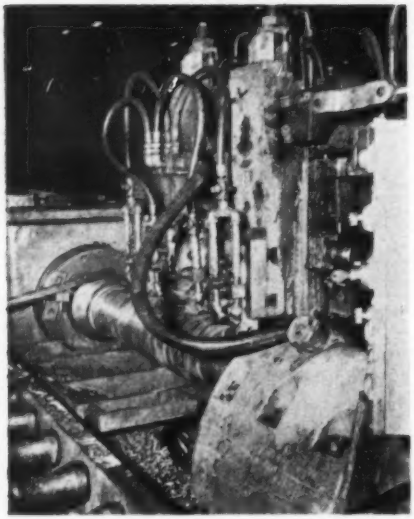


Nine tools are used in this automatic lathe at the Scranton ordnance plant operated by U. S. Hoffman to rough turn ordnance shells. This is the first operation in more than 10 required to produce the finished end product. View shows the six new grade 350 carbide inserts in action. The inserts are mechanically held on the six stations.

the job did involve cuts difficult to make, since previous carbides failed after only two cuts.

On some of the tougher machining jobs, like the machining of shell forgings (a modified 1045 steel) where the work comes from the steel supplier in scaly and out of round condition with varying steel analysis due to different steel heats, the new grade 350 outperforms other grades of carbides by 20 to 30%.

Blanks of grade 350 carbide are available in numerous sizes and three styles of rectangular blanks. All standard square, triangular, and round mechanically held inserts, finish ground ready for use, also are available in this grade.

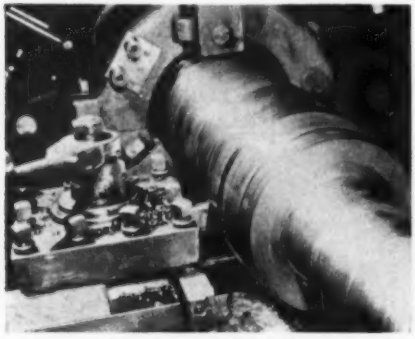
Grade 370 carbide insert blanks are stocked in a similar range of selected blank designs and sizes.

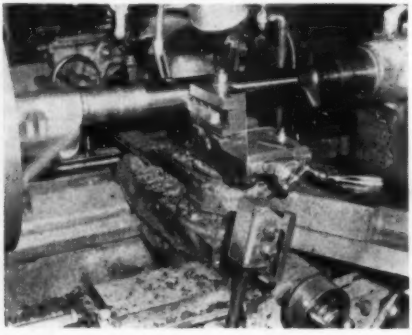
A wide selection of both right and left-hand standard tools is available in both grades.

Use ACTION Card, opposite page 64. Encircle No. 44

Use of new Carboloy grade 350 cemented carbide on this huge motor shaft in plant of an Eastern motor builder increased by about 30 per cent number of linear inches of metal cut compared with the previous carbide used. Shaft is AISI 1045 hot rolled steel with 228 Brinell hardness. Work was done on 40-hp lathe at a speed of 300 sfpm, depth of cut varying from 1/16 to 1/8-inch with feed of 0.020-inch.

Machining speed on this 4130 forged steel heat treated to 220,000 psi was stepped up from 125 to 185 sfpm when new Carboloy grade 350 cemented carbide was applied. Menasco Mfg. Co., Burbank, Calif., improved tool life better than 6 to 1 with the new carbide tool on this job. Machine is Monarch 25-inch lathe with tracer attachment.





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VERTICAL DESIGN

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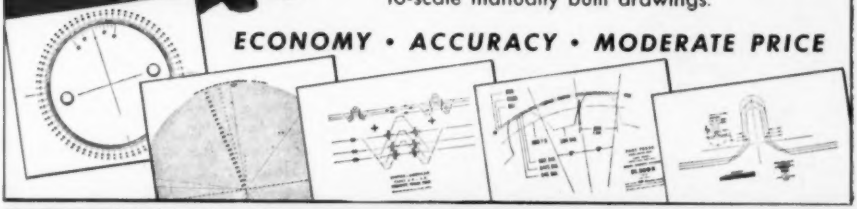

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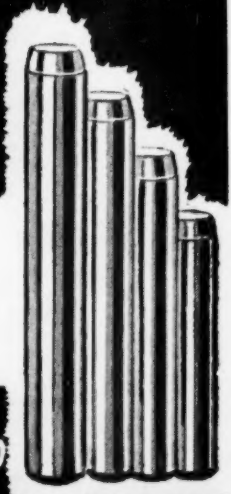

Standard Size Dowel Pins from ⅛" to 1" diameter and from ⅜" to 6" length supplied in .0002" and .001" over basic sizes. Unless otherwise specified, .0002 oversize will be furnished.

Dealer inquiries invited.

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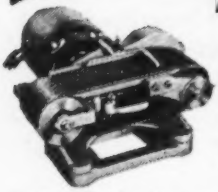
SIMPLEX-M
ABRASIVE BAND GRINDER



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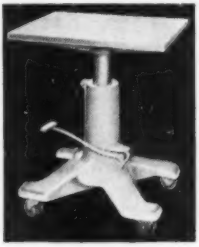

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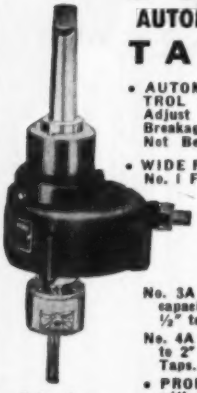

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- PRODUCTION THREADERS with Round Split . . . Button . . . Acorn Dies
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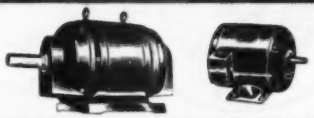

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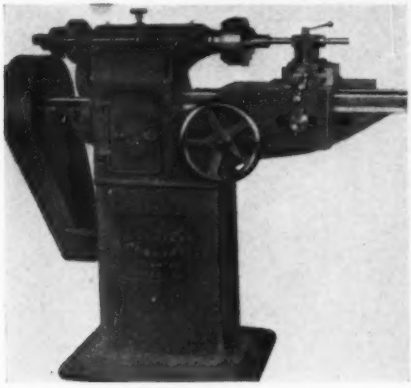
Flexibility featured in Fischer oil groover

Flexibility and simplicity of design are features claimed for the line of oil groovers manufactured by Fischer Machine Co., Dept. B, 310-16 N. Eleventh St., Philadelphia, Pa.

In design, all parts have been made convenient for the operator, it is claimed, insuring quick adjustment for cutting any size and style of groove within the scope of the machine.

The crank mechanism permits a movement of the carriage from zero to eight inches; this is all enclosed in a dustproof compartment.

The bearing in which a groove is to be cut is mounted on a revolving chuck secured on the work spindle and the boring tool is secured to the carriage slide which has a reciprocating motion timed with the work spindle, and linked by the crank gear and connecting rod.



By holding the work stationary and reciprocating the tool slide, a straight groove may be cut parallel with the axis of the bearing, and by holding the tool slide stationary with the spindle revolving, a round groove may be cut in a plane perpendicular to the axis. By making a proper adjustment between the speed at which the work is rotated and the number of strokes per minute made by the tool slide, various intermediate forms of grooves may be obtained between the two extremes running parallel or per-

Now... a quality JIG BORER that every shop can afford

The SIMA Jig Borer features an unusually large 32"x20" hand scraped table with 20" longitudinal and 15" cross travel. Designed by American shop men and solidly built by European craftsmen to combine accuracy, easy maintenance, versatility and medium price.

Created to small shop specs, the SIMA also handles large capacity work to a guaranteed accuracy of .0006" in 20". 16 spindle speeds; 35-1500 rpm. Spindle design facilitates use of standard tooling. Reasonably prompt delivery on this rigid well constructed SIMA Jig Borer. Write today for full details

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by using Whitehead Stock Washer Dies.

1500 SPECIAL SIZE DIES ON HAND.

Whitehead makes washers and shims from any metal or special material to your specifications. Thickness from .002″ to 3/8″.

In stock: S.A.E. standard light, medium, and heavy steel washers; brass and copper, small and large patterns; bolt sizes. Write for Whitehead's Catalog.

54-3

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WHITEHEAD STAMPING CO.

1671 W. Lafayette Blvd.
Detroit 16, Michigan

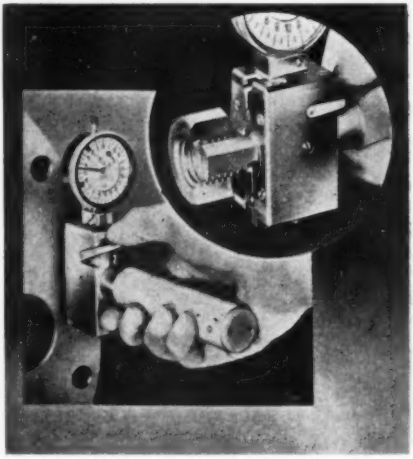
pendicular to the axis of the bearing. All grooves are made in quick setups.

Use ACTION Card, opposite page 64. Encircle No. 53

Three new gages by Scherr

The George Scherr Co., 200 MTD Lafayette St., New York 12, N. Y., announces a new line of indicating thread gages. One is a roller thread pitch diameter comparator gage and the other a dial thread plug gage for checking internal threads. Both instruments are designed for quick inspection by unskilled operators. The roller thread pitch diameter comparator gage has an indicator gage reading in .0001″ and is set by means of a master thread gage. A knurled thumb screw at bottom of indicator housing sets the hand to zero.

The dial thread plug gage measures internal threads by means of three interchangeable measuring jaws, of which the



middle one is retractable between the other two. The jaws are first inserted in a ring gage and the indicator set to zero, then used on the work and variations quickly observed on dial, which was previously set to prescribed tolerances by two adjustable tolerance hands. The middle jaw retracts when lever below indicator is pressed downward, the measuring jaws are inserted into the bore and upon release of lever, engage the thread inside of bore under spring action.

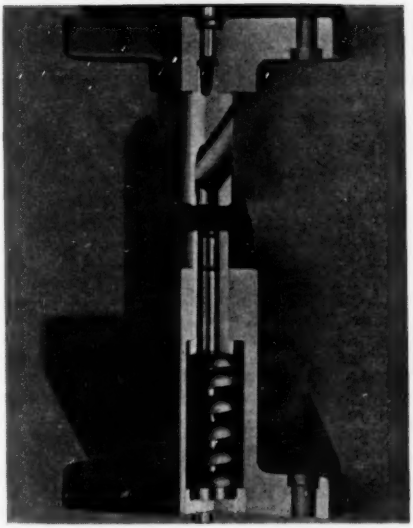
A new amplifying gage called "Millimess," used in many types of comparison indicating gages, and that may be built into machinery, fixtures, special gages, etc., was announced. It differs from conventional dial indicators in that it does not have fast revolving gear trains. Internal friction and inertia are said to be reduced to a minimum. It is especially designed to have great sensitivity.

Use ACTION Card, opposite page 64. Encircle No. 54

New hole punching units

Announcement of the new Type "JD" hole punching units has just been made by the Wales-Strippit Corp., Dept. MB, 396 Payne Ave., North Tonawanda, N. Y.

These new units are designed to punch mild steel up to ¼" thick and may be used and re-used in unlimited setups.



Each punch assembly and die assembly is independent and self-contained. The

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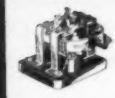

Power

Telephone

Shock Proof

Multiple Contact

Also voltage actuated, current actuated, sensitive, hermetically sealed and plug-in types.

punch assembly consists of holder, punch, stripping spring, punch guide and pilot head. The die assembly consists of holder, die and pilot pin.

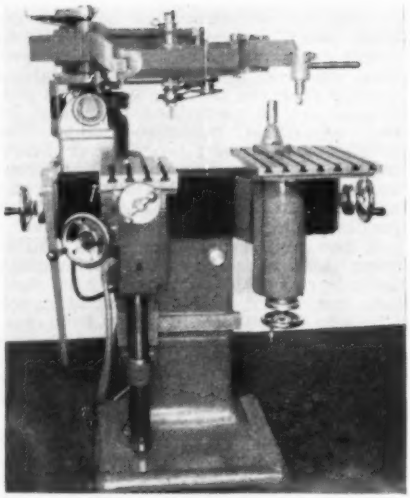
They are available in two holder sizes to punch round or shaped holes up to 7/8" in diameter.

Use ACTION Card, opposite page 64. Encircle No. 55

Larger Alexander die-sinking machine

J. Arthur Deakin & Son, 150-28 Hillside Ave., Dept. B, Jamaica 32, Long Island, N.Y., national representative for George H. Alexander Machinery, Ltd., Birmingham, England, is marketing an improved model universal die-sinking machine said to have larger capacity than any other machine in the line. It is used for the production of molds and dies, in either 2 or 3 dimensions, where irregular forms are of paramount importance. Maximum weight of workpiece: 1,000 lbs. Approx. ratios: from 1.5:1 to 10:1.

Features on the new Model 3 include 14 spindle speeds from 475 to 9,500 rpm, in geometric progression. The spindle is provided with standard ball races, and holds cutters up to 3/8" dia. A balancing device eliminates the need for a weight-



arm. A simple hand adjustment in the operating position enables the pantograph to be balanced at any ratio in any posi-

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NO OTHER GAUGE COMPARES FOR FAST, ACCURATE LAYOUT AND MEASURING

Capacities to 6" when used with this Fairfield Gauge 3" Riser

The Micro-Height Gauge is a precision instrument, finished in satin chrome, which reads like a micrometer and measures from zero at base to 3" in thousandths.

Use as a scriber for fast layout, or insert dial indicator for quick, accurate inspection.

Exclusive distributor for U.S. and Canada:

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W.H.O.* SAYS:

"Don't have FITS over FASTENERS, have fasteners that fit."

For the finest in milled-from-the-bar cap screws, set screws, coupling bolts and milled studs

DON'T GET STUCK, STICK TO THE ONES MADE BY

* Wm. H. Ottemiller Co. YORK, PA.

tion. Flange type motor simplifies the drive.

The casting carrying the pantograph has been modified to provide increased working area for all ratios.

Use ACTION Card, opposite page 54. Encircle No. 56

Micrometer adjustment expansion type stub reamer

This new tool announced by Ex-R Reamer & Tool Corp., Dept. B, Box 403, Rochester 2, N. Y., incorporates in its design the use of interchangeable reamers in self-aligning holders.

The holder, which is based on a micrometer principle, permits extremely accurate adjustment of the cutting size of the reamer, it is claimed. Any dimension within the size range of the reamer can be produced and maintained easily.

Nos. 1, 2 and 3 holders accommodate, respectively, reamer dia. sizes ⅛" to ¼", ¼" to ⅜", ⅜" to ⅞".

Use ACTION Card, opposite page 64. Encircle No. 57

High speed, heavy-duty, all-universal Brown vertical milling head

Brown Vertical Milling Head Co., Dept. B, 1615 Riverside Drive, Los Angeles 31, Calif., have announced a new high speed, heavy duty, all-universal, vertical milling attachment, with lapped-in, heat-treated spiral bevel compound miter gears, running silent in oil. The new stepped-up speed range has been increased to 4500 rpm, with ball bearing mounting throughout. Capacity of gear rating, 1½ to 15 hp.

For most makes and sizes of horizontal milling machines, boring mills, and planer

FOR PRECISION GROOVING, RECESSING AND BACKFACING

Versatile **MAXWELL** recessing tools can be used on any drill press, boring mill, turret lathe, radial drill or milling machine. Ball-bearing pilots and high speed or carbide cutters are interchangeable to handle any job within range of holders.

MAXWELL recessing tools are precision built for sustained accuracy in production runs . . . yet take cuts at unusually high feeds. 4 sizes available for ⅜ to 4-inch holes.

Write today for literature.

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For superior cutting performance with *safety*, insist on Star Unbreakable High Speed Steel Flexibles. No premium price for safety, fast cutting and long life.

They are made with a high speed steel toothed edge, welded by a special process to a flexible steel back. Eliminate tearing along weld—shattering—flying pieces.

Order Star High Speed Steel Flexibles from your Star distributor. And remember, he carries the leading lines of all kinds of tools and industrial supplies. And on extra-difficult metal sawing problems, he will quickly get a Star factory representative to help you.

Sold Only Through Recognized Distributors.

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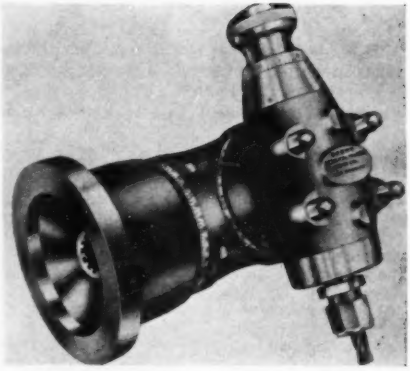
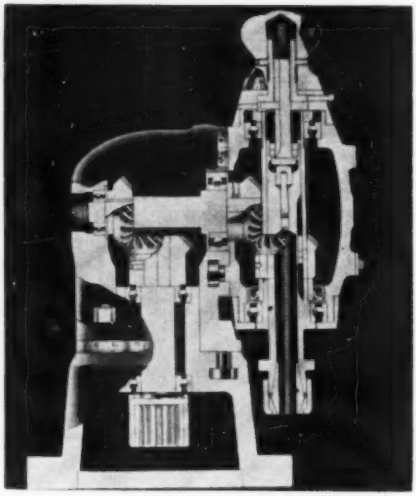
MIDDLETOWN, N. Y., U. S. A.

Makers of Hand and Power Hack Saw Blades, Frames, Metal and Wood Cutting Band Saw Blades and Clemson Hand and Power Lawn Machines.





machines, the heads are available in 32 sizes and models. The micrometer vertical spindle feed quill is optional.

The head may be mounted in two plane positions on the horizontal milling machine. The cone base type head is bolted to the vertical column of the milling machine and operated with direct power take-off from the front main spindle drive; and the over-arm spindle drive adapter type Brown head is mounted into the over-arm bore and operated with direct power drive take-off from the rear main spindle on the milling machine table.

Use ACTION Card, opposite page 64, Encircle No. 58

BROACHES

. . . both standard and special are available. Whatever your need for broaching tools may be, Conant can supply them to your specifications AND satisfaction.

FIXTURES

. . . for broaching machines are also featured products manufactured by Conant. "Know-how", combined with a willingness to work with plants in developing proper fixtures are advantages which Conant users enjoy.

SHARPENING SERVICE

. . . is available on all types of broaches. Reconditioning of broaches is also a Conant service. Work is done by expert workmen who know broaches and can make used, dull broaches "as good as new".

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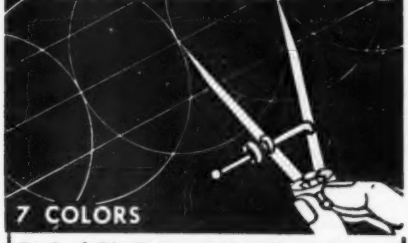

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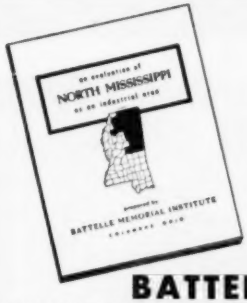

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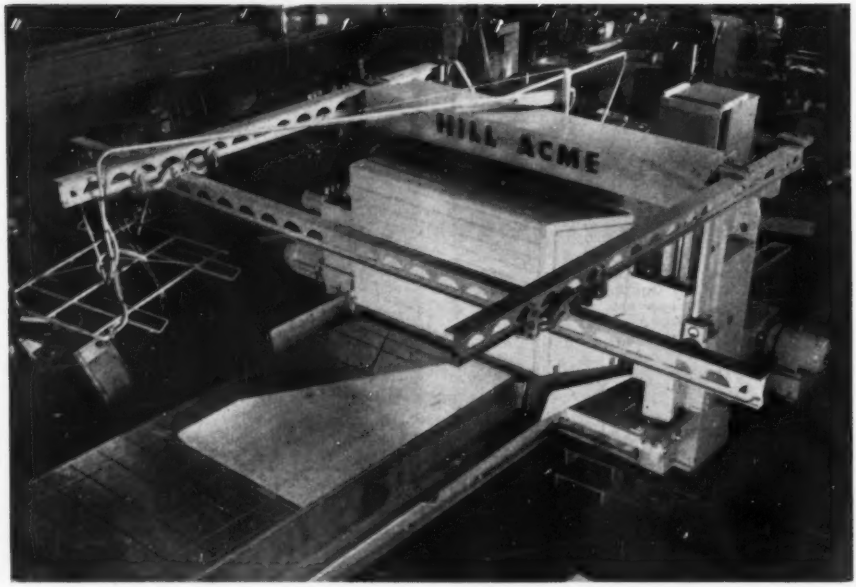
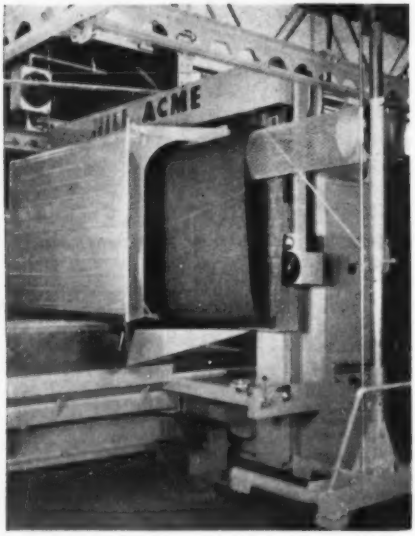
Harry W. Clark, Executive Director

Hill Acme builds world's largest precision abrasive belt grinder





A revolutionary machining process using extremely wide endless factory coated abrasive cloth belts (138" long x 86" maximum width) brings to the aircraft industry an entirely new and proven method of grinding flat and tapered aluminum aircraft wings and fuselage skins.

The Hill Acme Co., Dept. B, 1201 W. 65th St., Cleveland 2, Ohio, has just completed the world's largest heavy duty abrasive belt grinding and polishing machine.

This 84" wide abrasive belt hydraulic table type grinder, for accurately machining compound tapers on "flat" aluminum plates, is said to assure close tolerances on tapered sections and also produce a finish that is far superior to conventional taper rolling and milling operations.

The grinder is powered with a 250 hp motor, and the positive hydraulic reciprocating table drive of this unit permits instantly variable speeds. The machine is equipped with a coarse grit silicon carbide abrasive belt, equally efficient for heavy stock removal as well as grind-

ing to close tolerances. It grinds the entire width and length on the aluminum plate or section through each pass of the table under the abrasive belt.

The heavy grinding as well as the finishing operation is performed by using waterproof cloth abrasive belts together with a coolant, and the "wet" process is required for two specific reasons. (1) During the rough grinding operation, heat will be developed unless adequate means of cooling is provided and with aluminum aircraft sections certain metallurgical changes will occur if the temperature increases beyond the critical point. (2) High pressure coolant nozzles are directed at the point of contact between the abrasive belt and the work being processed in order to keep the stock cool at all times. Further, extremely high pressure is required so that the coolant spray will break through the turbulence of air caused by the high speed of the abrasive belt. Coolant nozzles are also directed against the abrasive belt in order to avoid "loading." Additional jets are placed in the coolant return troughs to liquefy the sludge and move it into the filter—all coolant is returned to the filter and recirculated. It has been determined that the sludge may be salvaged and remelted.

The Hill 2-roll vertical head assembly covers basically a dynamically balanced upper steel idler roll and a lower rubber covered contact or work roll—over which the abrasive belt travels. The contact roll being the driving roll eliminates slippage of the abrasive belt, thereby increasing belt life. The pneumatic belt centering device insures positive tracking of the abrasive belt irrespective of dirt or moisture. The centering mechanism is adjustable to compensate for varying width belts within the capacity of the machine. A special spindle housing assembly of the quill type supports the back end of the rubber covered contact roll, while the front end is supported by a readily accessible roller bearing assembly which is easily removed when it becomes necessary to change the "quill type" rubber covered work roll. The machine is provided with a very hard (high durometer) neoprene covered contact roll and this dense synthetic rubber covering of the work roll has been found necessary to produce the proper cutting action which permits heavy roughing as well as fine finishing cuts on aluminum plates. In order to produce sufficient power for the heavy cuts that this machine will deliver, it is equipped with a 250 hp main drive motor and reduced voltage control.

The 84" wide x 16' long table of this taper skin grinding machine is reciprocated by means of two opposed pistons and cylinders together with low pressure hydraulic pumps and valves for smooth, positive, accurate and economical operation. A 20 hp motor is used to operate the two heavy duty hydraulic pumps. A uniform diameter of the rubber covered contact roll is essential for proper operation of the machine, as well as achieving the desired grinding results. The company supplies as standard equipment a pneumatic contact roll dresser attachment which insures rapid and accurate refacing or redressing of the work roll at operating speed without removing it from the machine. However, when the contact roll is to be removed for recovering or replacement occasioned by a change in the durometer or density of the rubber, the removal of this roll can be accomplished quickly and easily due to its tapered quill design.

Floor to floor time required to produce individual aluminum tapered sections with the machine by abrasive belt grinding is estimated to be 50% below that of conventional skin milling, and subsequent operations of polishing aluminum sections as low as 10 r.m.s. is rapidly accomplished with fine grit belts. The Hill Acme Co., Dept. MB, 1201 West 65th St., N.W., Cleveland 2, Ohio.

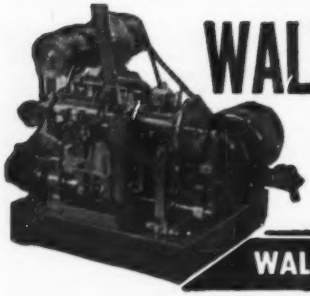
Use ACTION Card, opposite page 64, Encircle No. 15

New Fidelity wire stripper, Super X-Var No. 622, for special jobs and faster stripping action

A new, more powerful wire stripping solution designated as Super X-Var No. 622 has been announced by Fidelity Chemical Products Corp., Dept. B, 470-474 Frelinghuysen Ave., Newark, N.J., manufacturer of cleaning and stripping materials for industrial requirements.

Super X-Var No. 622 is a free-flowing, paste-type stripper similar to X-Var No. 306, designed to remove formex, formvar and enameled coatings from wire. In addition to performing all the functions of X-Var No. 306, this new product is strengthened so that it will also remove many coatings that regular X-Var No. 306 will not. It is also effective when faster stripping action is desired.

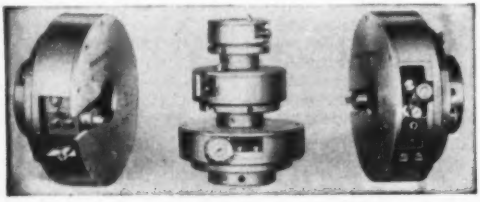
Use ACTION Card, opposite page 64, Encircle No. 16



WALTHAM PINION AND GEAR CUTTING *Machines*

These machines are finished according to the work to be done. Send samples or dimensioned drawings and tell us about the cutting qualities of the material and probable production per week or month. Then wait for our reply with bulletin.

WALTHAM MACHINE WORKS WALTHAM 54 MASSACHUSETTS



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FACING HEADS

with Automatic Feed

One-way Tool Feed — 6, 9 and 12" sizes.

Two-way Tool Feed — 9, 12, 16, 20, 24, 30, 36, 40 and 46" sizes.

Save many costly set-ups.

Bulletin No. 4141 Gives Full Details

MUMMERT-DIXON CO., 122 Philadelphia St., Hanover, Pa.

You Need an Extra Hand Now to Speed Up Production!

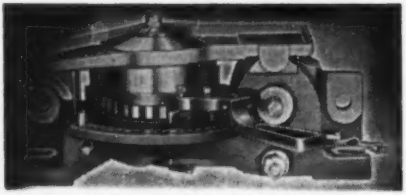
HEIMANN TRANSFER SCREW SETS

Here is the *faster*, more precise way of transferring open and blind screw holes—make savings in "wage-dollars-per hour" of your expensive hands on every job. A die-and-tool maker's tool with many other applications for die makers and machinists. A set of 6 Hardened Screws nested in combination holder and wrench—no other tools needed. Get more work *now*—save money tool

IN 11 SIZES—No. 6 to 1" N.C. In all S.A.E. sizes.

HEIMANN MFG., CO. ● URBANA, OHIO

MODEL H . . . AUTOMATIC CHUCKING and INDEXING FIXTURE



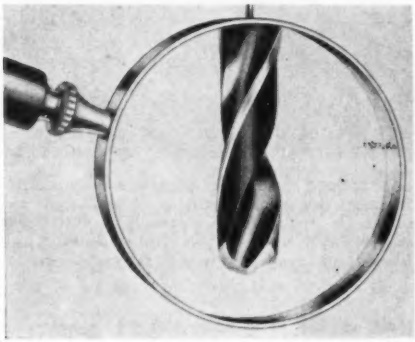
1. 1800 light cuts per hour.
2. Either horizontal or vertical position.
3. Collets changed instantly.
4. Automatically knocks piece out.
5. Ratchet or degree indexing—degree indexing added later if desired. Capacity 1".
6. Automatic indexer also added later. Model F—Both degree & ratchet indexing. Capacity up to 2¼".

Write for Folders.

J. W. DEARBORN, Ansonia, Conn.

Small hole drills

Whitman & Barnes, 40600 Plymouth Rd., Plymouth, Mich., has perfected a method of manufacturing drills in the range 0.15 M/M (.0059")—1/16" that is claimed to be successful in producing consistently



accurate cutting points. The flutes of the drill are ground from solid heat-treated blanks, resulting in a uniform, close-tolerance tool that is not subject to the distortion of any subsequent heat treatment. At the same flute grinding operation, the drill is point-ground without removing it from its holder, so that the cutting lips always bear the correct relation both to the flutes and to the axis of the drill. This positively provides a high degree of centrality.

Use ACTION Card, opposite page 64. Encircle No. 75

New universal i.d.—o.d. gage for shallow diameters

A new universal i.d.-o.d. gage, designed especially for gaging shallow bores or shoulder diameters, is now being manufactured by Federal Products Corp., Dept. B, Providence, R.I.

Designated as Model 88 P-10, this new gage features easy adjustment to suit your diameter requirements and locating buttons which can be adjusted for height so as to locate the measuring contacts at the desired elevation. It has a tubular frame, is light in weight and easy to handle with either one or two insulated hand grips, depending on the length of the tube. These grips prevent heat transfer from the operator's hands so that there is no danger of tube expansion from this cause. A high degree of accuracy is maintained through its rigid construction and the elimination of flimsy joints. The lack of overhanging extension posts

THE costliest cutting tool IN YOUR PLANT

No—it's not a tool of production—it's a tool of destruction! . . . it is ABRASIVE GRIT—by-product of your grinding, cutting and finishing operations.

CYCLONE TYPE

Hammond DUSKOLECTORS

FILTER TYPE

Protect employees' health
Protect nearby materials and machine tools
Reduce cleaning costs
Provide cleaner working conditions

Eliminate the dust menace.
Write for catalog today.

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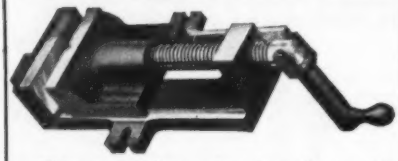
630 W. 17th St., Costa Mesa, Calif.

PRECISION GROUND ANGLE PLATES

Made of the finest grade of Material, aged, Heat Treated, Precision ground, and Polished within .0005 of an inch in Six inches. Six Way Steelton Right Angle Irons and Angle Plates are time savers. "Matched Pairs" are precision ground together, assuring positive duplication in Size. Prices on Request are F.O.B. Costa Mesa, California.

YOST DRILL PRESS VISE



This new Yost vise has been designed expressly for use on drill press operations. Does away with special and costly jig fixtures.

Offered in two sizes.

Vise No.	Width of Jaw, Inches	Opens Inches	Weight Pounds
1D	3½	3½	12½
2D	5	5½	23

Do you need a vise of ANY type?

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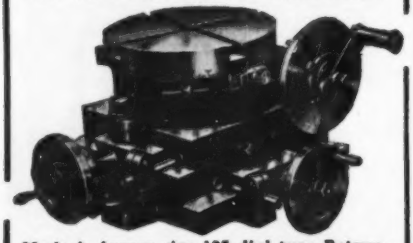
The *STEVENS* Line

SINCE 1925

Showing 7½" Dial Type Rotary Table mounted on compound table No. 1

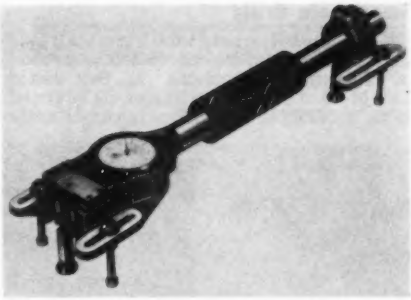
- Traverse and Circular Movements -



Made in larger size 12" dial type Rotary - compound table No. 2. Either unit usable separately. Five sizes of Rotary Tables. Adjustable tilting tables. Multiple spindle index centers. Screw head slotters. Vises.

Write for Bulletins

The JOHN B. STEVENS Company
SOMERSVILLE, CONN

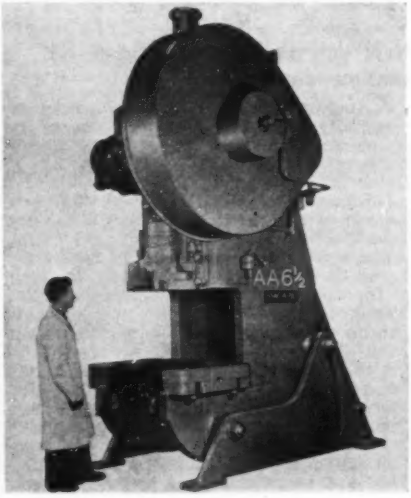


or exposed indicator spindles also helps to keep the gage accurate. The measurement is transferred through a sensitive pantograph unit to the dial indicator.

Use ACTION Card, opposite page 64. Encircle No. 76

New series of Niagara O.B.I. presses features Electro-Pneumatic clutch

Just introduced is the new line of Niagara open back inclinable presses (Series AA). Each press is equipped with the Niagara Electro-Pneumatic clutch. Electrically controlled and air actuated, this clutch is said to combine advantages of both friction and mechanical sleeve clutches. It may be engaged or disengaged at any point in the stroke. It can be single stroked, jogged or run



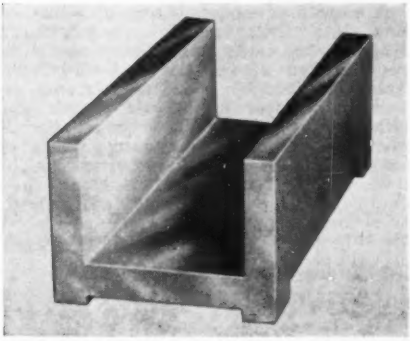
continuously and, as a safety feature, stops automatically if power or air pressure fails. There are no friction members to slip or heat up. Available in eight sizes with shaft diameters ranging from 3″ to 7½″. Niagara Machine & Tool Works, 637 Northland Ave., Buffalo 11, N.Y.

Use ACTION Card, opposite page 64. Encircle No. 77

Versatile jig bodies

The new Smith standard jig and fixture bodies are made with ground parallel sides and base plate and come in 7,500 different stock sizes; adapted to nearly every type of tumble fixture problem simply by adding jig feet to any side. Smith bodies come only in their one universal shape—finished on top, bottom and on all inside surfaces.

The main time-saving advantage of the Smith jig and fixture bodies is said to be



that they conform to the usual tooling practices and require no change of operational procedure.

The complete range of sizes: 1″ to 12″ long in ½″ steps, 1½″ to 12″ wide in ½″ steps, 1″ to 5″ high in ¼″ steps. Smith Eng. & Tool Co., 191 Bay Ave., Glen Ridge, N. J.

Use ACTION Card, opposite page 64. Encircle No. 78

New 16″ versatile band machine

The DoAll Co., Dept. B, Des Plaines, Ill., announces a completely new line of 16″ band machines with 12″ thickness capacity for shop use and powered for tough, straight or curved metal sawing operations or woods, plastics, etc. They are easily arranged for band filing, metal polishing and carbide finishing as well as slicing by applying the proper band tool, tool guides, and the use of attachments and accessories built for the machine.

WESPO

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BOLSTER & T-SLOT TYPES
to J. I. C.
press room standards

Forged, precision machined heat treated. Tensile strength 150,000 lbs.

SIZES

BOLSTER BOLTS — dia. to 1½″ Heads sq. to 3″ hex. to 2⅜″ T-Slot bolts, ½″, ⅝″, ¾″ dia. lengths to 12″. 1″ dia. 4″ to 22″ long.

NUTS — hardened — threaded to close fit. WASHERS — hardened — ground both sides.

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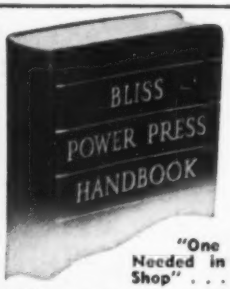
26931 W. 7 Mile Road
Detroit 19, Mich.

Carbide tools can also be finished.

Attachments may be procured for circle cutting, mitering, cut-off work, ripping, friction sawing and for handling heavy work. Several types of work feeding attachments can be selected including a power work feed, screw and ratchet work feed and work holding jaws. For work illumination, two types of table lamps are available as well as an illuminated magnifying attachment. Coolant and chip disposal facilities, blade shear for saw welder, etching pencil and a supply cabinet are additional accessories.



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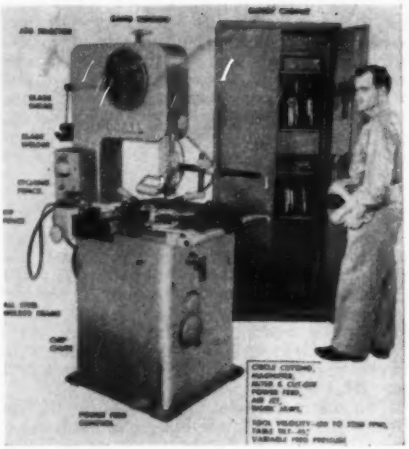

A variety of models is available in this new line. This includes models with fixed or variable speed controls with speed range between 50 and 5200 fpm. There are variable speed models encompassing high or low speed ranges for either high-speed, friction or conventional sawing or a broad speed range machine for operations at both low and high speeds. The fixed speed machines include models with a single fixed speed or several stepped speeds.

Use ACTION Card, opposite page 64. Encircle No. 79

Lehigh tracer tool adaptable to lathes 16" to 24"

The new Lehigh Model M 1500 profile tracing tool is claimed to be a simple, compact and inexpensive precision duplicating attachment adaptable to medium size lathes such as those in the 16" to 24" size range. It is all-mechanical having no complicated electronic or hydraulic

HIGH SPEED or CARBIDE

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FOR HOLES FROM 1/16" UPWARD
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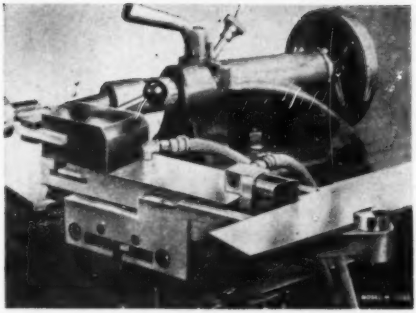

mechanisms.

In installation the lathe compound is removed and the tracer tool is mounted directly on the cross slide. Normally, a mounting pedestal is not required, but it is furnished when needed.

A horizontal slide, operating between two rows of ⅜" pre-loaded ball bearings, eliminates slap and side play; positive contact between stylus and a ¼" template by air pressure applied to tool through a pressure regulator and a four-way valve; shop line air pressure sufficient. Lehigh Foundries, Inc., Air Control Div., 1500 Lehigh Drive, Easton, Pa.

Use ACTION Card, opposite page 64. Encircle No. 80

Ex-Cell-O introduces compact power unit with long stroke

A new quill type hydraulic power unit for actuating tools in special machines has been introduced by Ex-Cell-O Corp., Dept. B, 1200 Oakman Blvd., Detroit 32, Mich. The new unit, Style 22, has a capacity of 3 hp and a stroke of 8".

A companion unit, the Style 22-L is identical to the Style 22 except that it has a 12" stroke, and therefore is a little longer. Like the other standard Ex-Cell-O hydraulic power units, the new models are self-contained, hydraulically operated, and designed to accommodate single tools or multiple spindle heads for such operations as drilling, reaming, counterboring and spot facing.

The unit cycle may be initiated electrically or manually. The cycle may include rapid approach, first and second feeds, reverse, rapid return and stop. The lengths of rapid approach and feed movements, the reverse and stop positions are controlled by adjustable dogs. Feeds are adjustable by means of orifice dials protected by a hinged cover. The electrical equipment is enclosed, yet is readily ac-

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Now you can be certain of positive control of hole depth with the WOHLNIP Precision Drill Stop . . . which is Non-Rotating. Will not mar, mark or damage the face of the work, fixture or bushing. Completely automatic, the WOHLNIP Drill Stop reduces human errors, simplifies difficult jobs, lowers machining cost, increases production and accuracy, eliminating rejects. Used for drilling, center drilling, countersinking, boring, milling, routing, reaming. Used on drill presses, radial drills, milling machines, lathes, turret lathes, hand and automatic screw machines. Available as shown and with standard straight and taper shanks for any size needed.

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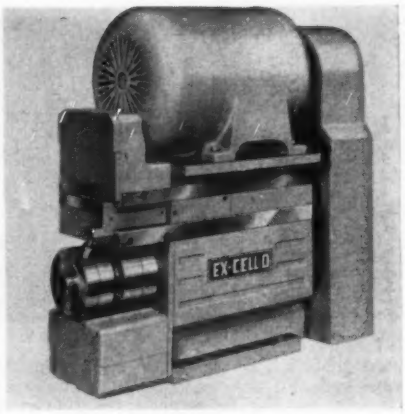


cessible for inspection or service.

Among hydraulic features of the new units are outside, gasket mounted pump and control valve, closely fitting cylinder assembly that does not require rings or packings, quill sealed against both internal hydraulic drain and external coolant. The hydraulic control valve has a single plunger, and is operated either manually or by a solenoid.

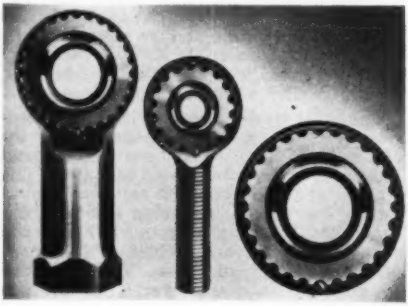
Use ACTION Card, opposite page 64. Encircle No. 81

New line of spherical bearings

A new line of spherical bearings and spherical rod end bearings has been introduced by Lincoln Park Industries, Inc., Dept. B, 1719 Ferris Ave., Lincoln Park 25, Mich. They are supplied in several different sizes and types.

These products, known as Adjusta-Ball bearings, provide a means to adjust the ball race to provide accurate positioning of the bearing.

Each bearing race insert is so designed



that it may be adjusted to any desired degree of relationship to the ball. By the use of a spanner wrench inserted in the notches on the outer edge, the race can be tightened or loosened with a one notch adjustment being slightly less than .001". Once the adjustment is made the bearing race inserts are locked firmly in position by means of a set screw inserted through the notch which is at the bottom position. All Adjusta-Ball bearings are prelubricated.

Use ACTION Card, opposite page 64. Encircle No. 82

Durant launches new predetermined electric productimeter

The Durant Mfg. Co. announces an electrically operated predetermined counter. Production can be controlled on any electric counting installation to the exact quantities required, thus eliminating losses due to over-runs or under-runs, it is said.

This new "SP-MF" is constructed like the small "SP" predetermined models brought out by Durant in 1953. They are entirely enclosed for protection against dust and moisture. Over-all dimensions are 4⅜" wide by 2⅛" deep and 2⅝" high. Weight is 1¾ pounds. Speed is 600 counts per minute.

Available in either four or five figures,

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HAMMOND Carbide Tool Grinders will soon pay for themselves through greater wheel economy, longer tool life and faster grinding.

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ALVA F. ALLEN, Dept. MTB, Clinton, Mo.

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***Dahlstrom* TAP GUIDE**

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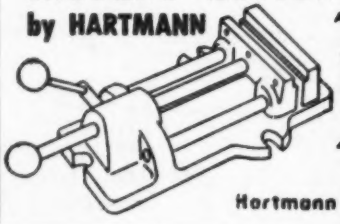

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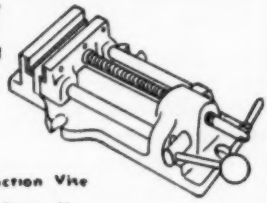
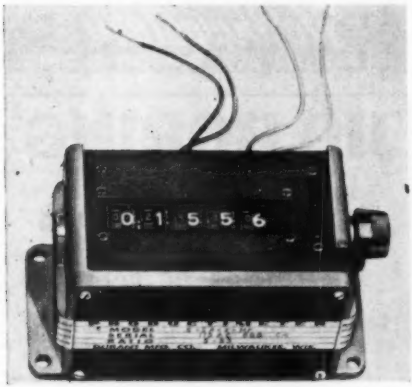


Hartmann Mfg. Co., 1637 Goold St., Racine, Wisconsin

these "SP-MF" models are actuated by electric impulses to close or open a switch at any pre-set count from 1 to 9999 or 1 to 99999 respectively. A metal hinged cover provides quick access to the predetermined wheels for easy setting.

Durant Mfg. Co., 1928 North Buffum Street, Milwaukee 1, Wis.

Use ACTION Card, opposite page 64. Encircle No. 83

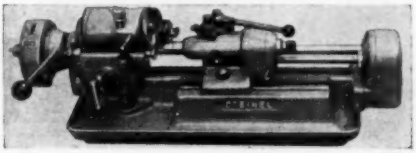


Burnishing machine

Morey Machinery Co. is introducing a new Steinel pivot burnishing machine for the finishing of bearing surfaces on spindles, pivot shafts, drive journals, etc., to insure proper size and improve surface quality.

This machine comes in two models—SR2n which takes a minimum and maximum diameter of work from .019" to .078"; and Model SR3n with minimum and maximum of .039" to .314".

Burnishing can be performed with tool



steel or tungsten carbide discs, the principal difference is that the tool steel disc will remove metal faster due to its rougher surface: the tungsten carbide disc is slower in operation but gives a better finish. Morey Machinery Co., Inc., Dept. B, 406 Broome St., New York 3, N.Y.

Use ACTION Card, opposite page 64. Encircle No. 32

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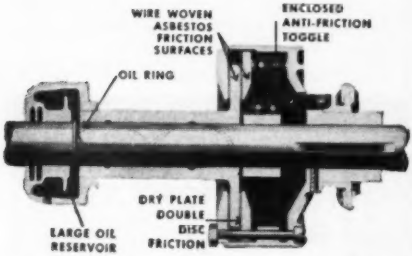

This time-tested clutch provides maximum power transmission at lowest cost. For specifications and prices on wide range of sizes, write for Bulletin No. 25B. Brown Engineering Co., 126 N. Third St., Reading, Pa.

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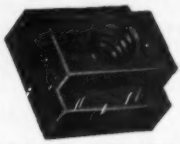

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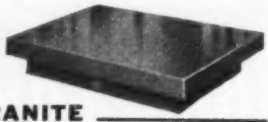

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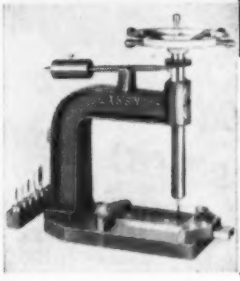

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for all HARDNESS TESTING, Throat 4", Gap 10", Wt. 27 lbs. — ACCURATE

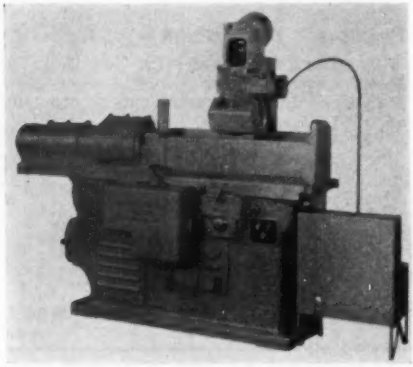
Puts actual load of 3000 KG on 10 mm. ball. Test head removable for testing very large parts.

ANDREW KING
P. O. Box 606-H
Ardmore, Pa.

Redesigned Barber-Colman No. 10-12 sharpening machine

The Barber-Colman No. 10-12 hydraulic sharpening machine has been redesigned to accommodate wet grinding of high-speed steel and carbide-tipped hobs and form-relieved cutters. New wheel spindle and work spindle are fully protected against the effects of coolant. Splash guards and coolant tank and motor are extra equipment which may be ordered for installation on a standard machine.

In addition to the fully protected spindles, the wheel spindle has also been made more rigid for a finer surface finish on the faces of the flutes. Wheels are mounted on an adapter which fits onto the tapered wheel spindle. This allows diamond wheels to be trued on a tool grinder without destroying any of their trueness when remounted on the No. 10-12. The wheel motor is mounted parallel to the wheel spindle, and the drive is through a Gilmer "timing" belt, eliminating any possibility of slippage. A new dresser provides for easier and more accurate setting of the diamond.



The No. 10-12 sharpening machine handles a wide variety of tools with straight or helical flutes, shell or shank type, up to 10" diameter by 12" face width. Barber-Colman Co., 7412 Rock St., Rockford, Ill.

Use ACTION Card, opposite page 64. Encircle No. 67

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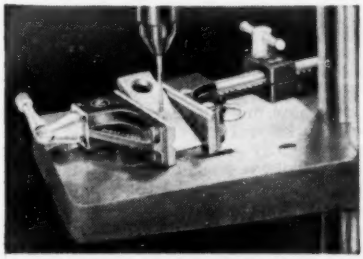
can repay its cost the very first day!

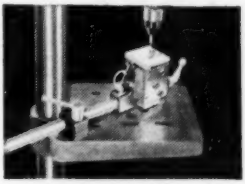


PREVENTS ACCIDENTS — This full-floating, securely anchored drill press safety vise holds work, including sheet metal, for drilling in many positions . . . keeps it from flying off the table.

CUTS JIG COSTS — Serves as base and instant-opening mechanism for low-cost jig . . . cuts jig parts and costs by as much as 80%.

SPEEDS SET-UPS — Ratchet-locking jaw slides instantly from maximum (9" or 12") opening to any position. A ¼-turn of the handle and screw-actuated jaw positively grips or releases work, including round stock.

Ask your distributor for a demonstration or write us for folder W-50.



Above: Angle Drilling

Below: Low-Cost Jig

Wahlstrom Float-Lock Sales Dept.
American Machine & Foundry Company
Room 15, 261 Madison, New York 16, N.Y.

Another AMF Product

Float-LOCK
SAFETY VISES

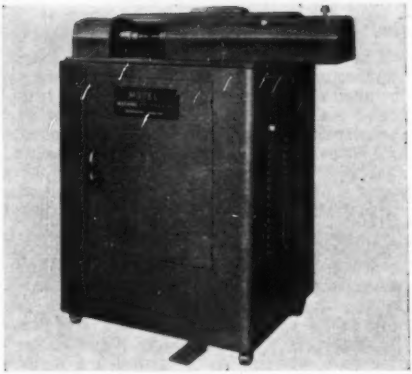
New York 16, N. Y.

Double action deburring machine

According to the manufacturer, the new Model "A" semi-automatic deburring machine removes burrs from both sides of the holes at the rate of 600 to 3000 holes per hour. Using standard countersink type deburring tools, the spindles rotate in opposite directions giving an equalized cutting action. The capacity of the machine is 6" between chucks and will take up to a 1" diameter hole.

Work holding fixtures are not necessary as operator merely inserts part, depresses foot control valve pedal and the machine automatically deburrs both sides of the hole simultaneously leaving hands free for loading. The setup time is reduced to a minimum as the machine can be changed from one workpiece to another within three minutes, making it possible to be used profitably on production as low as 25 pieces.

The machine is equipped with air controls for infinite cycling and speed control and the pressure required to operate the machine is 5 to 40 pounds with a minimum air consumption. The machine is driven by a 1/3 h.p., 115-120 volts, single phase, capacitator motor, and equipped with a variable speed drive. Model Machine Co., Dept. B, 4729 Hawthorne St., Philadelphia 24, Pa.



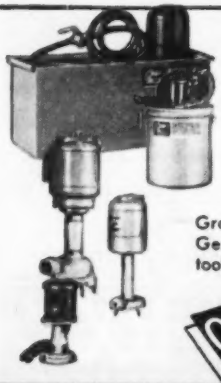
Use ACTION Card, opposite page 64. Encircle No. 59

Pneumatic die cushion

The Dayton Rogers Mfg. Co., Dept. B, Minneapolis 7, Minn., announces a new Model H full universal pneumatic die cushion.

This cushion, in the various sizes, is

Only... GRAYMILLS COOLANT PUMPS give you ALL these advantages



- Complete systems, with fittings, to fit any standard machine tool
- Easily installed—in a manner of minutes
- A size for every need—38 standard models—Pumps only or Pump and Tank Units
- Can be used with liquids bearing abrasives
- Dependable—long wearing—economical to use
- Stocked by distributors everywhere

Graymills Centrifugal pumps, for high volume at low pressures, or Graymills Gear pumps where high pressures are desired, are ideal for every machine tool application—for coolants, oils and compounds. Tank capacities range from 2 to 128 gals. Motors are of nationally known quality in 1/25, 1/8, 1/4 and 1/2 H.P., totally enclosed or drip-proof.

GRAY-MILLS

Call your nearest Industrial Supply Distributor, or write direct for catalog.

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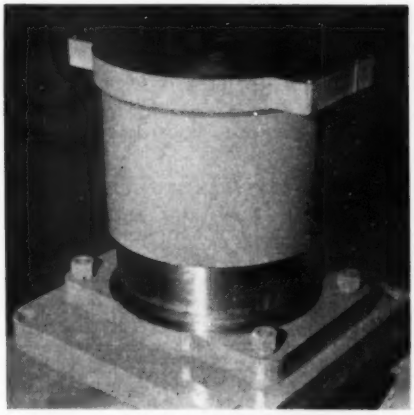
CONTINUOUS HINGES ▶ **FOR ALL YOUR REQUIREMENTS**

Wherever continuous hinges and metal corners are needed, you'll find the answer at Rex . . . a reliable source of supply with the finest facilities to meet your requirements. Hinges furnished in brass, aluminum, stainless and steel.

ALSO METAL STAMPINGS OF ALL TYPES

Send Us Your PROBLEMS

REX METAL PARTS CO.
1297 WEST 78th STREET
CLEVELAND 2, OHIO



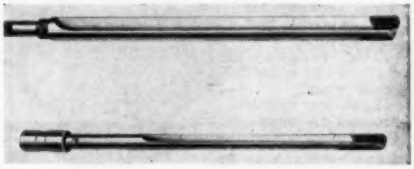
claimed to develop a ring holding pressure, on 100 lb. airline, of ½-ton up to and including 45 tons, single cylinder design, thus giving the minimum overall height where high pressures are needed, in a limited press bed opening.

This equipment is of all-steel construction, and is provided with internal guiding means to compensate for off-center loading. The furnished hardened and ground pin pressure pad is custom made to fit details of the press bed opening. It is also provided with an adjustable stopping means which will arrest the pin pressure pad at any desired position on the up cycle of the pneumatic die cushion. This is now available in sizes of 10" to 24" cylinder dimension.

Use ACTION Card, opposite page 64. Encircle No. 60

Carbide tipped gun drills for deep hole drilling

Whitman & Barnes, 40600 Plymouth Rd., Plymouth, Mich., announce that they now make their carbide-tipped gun drills in a solid high speed body or oil tube body type, the former for comparatively shal-



DYKEM STEEL BLUE

Stops Losses making Dies and Templates

Popular package 8-oz. can fitted with Bakelite cap holding soft-hair brush for applying right at bench; metal surface ready for layout in a few minutes. The dark blue background makes the scribed lines show up in sharp relief, prevents metal glare. Increases efficiency and accuracy.

Write for sample on company letterhead

THE DYKEM COMPANY
2301G North 11th St. • St. Louis 6, Mo.

PRECISION TOOLMAKERS VISE

1¼" Jaw $18.40
1⅞" Jaw $32.95

Precision ground square and parallel to .0004/in. non-cumulative. Ground dovetailed slide. Hardened and ground jaws. Dustproof enclosed screw. Ample clamping grooves. Excellent for jig-boring, precision grinding, inspection. 10 day money-back GUARANTEE.

Dealer Inquiries Invited

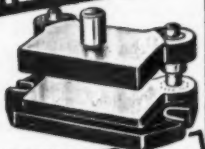
AIR TRANSPORT EQUIPMENT, INC.
Old Country Road Mineola, N. Y.

NEW NESTING TYPE TOTE PANS

Sturdy 16 ga. metal. 20" long x 12" wide x 6¼" deep. Drag holes and handles at both ends.

J. L. LUCAS & SON, INC.
Bridgeport 5, Conn.

DANNEMAN *Precision* DIE-SETS



Precision-Bored on Master Plates

●

DANNEMAN DIE-SET DIVISION
ACME-DANNEMAN COMPANY, Inc.
201 Lafayette St. New York 12, N. Y.

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CAMS

To Your Specifications except Screw Machine Cams

Design Assistance Offered

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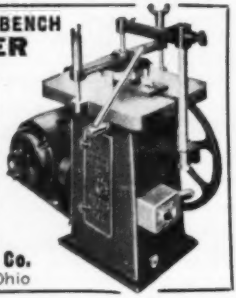

Portable — move directly to job; a time saver for both small and large shops.

3¾" stroke; adaptable for other work.

Low first cost—prompt delivery.

Good dealers wanted.

Reading Machine Co.
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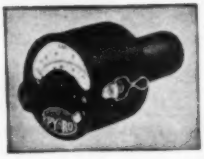
PYRO Radiation Pyrometer



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BY A QUICK, EASY, INEXPENSIVE METHOD
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KENNAMETAL CUTTING TOOLS

● *for Increased Productivity*

KENNAMETAL *Inc.*
LATROBE, PA.

CEMENTED CARBIDE TOOLS, BLANKS, MILLING CUTTERS

low holes. In both cases, oil under pressure is used to cool the cutting lip and force the chips out of the hole.

Deep holes are determined by the relation of drill diameters to the depth of hole desired. Gun drills are used for hole depths of from 4 to above 250 times the diameter.

It is practical to revolve either the drill or the workpiece. In some instances, it is reasonable to revolve both. Oil can be forced through the end of the shank or the side, depending upon the machine in use.

A gun drill takes its torque on one cutting lip. Due to this, much attention must be given in the original design and manufacture of the cutting lip of the drill. After the drill has become dull, an equal amount of care must be used in resharpening.

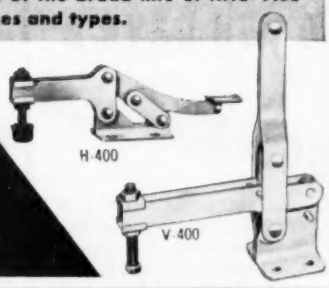
These drills can be used in vertical or horizontal positions. Application can be singular or multiple, depending upon the setup in the machine. In extreme overall lengths, a great amount of care must be given to maintain constant oil pres-

TOGGLE CLAMPS With added valuable feature — now offered to you as part of the broad line of KNU-VISE Toggle Clamps—in many sizes and types.

they're **NON-CORROSIVE!**

they're **NON-MAGNETIC!**

they're of **STAINLESS STEEL!**

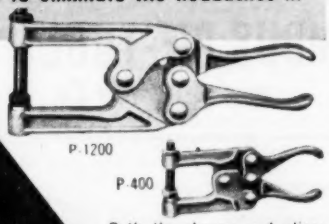


TOGGLE PLIERS Here is the KNU-VISE answer to your need for a portable clamp to eliminate the headaches in spot welding aluminum.

they're **NON-MAGNETIC!**

they're **NON-CORROSIVE!**

they're of **K-MONEL!** *(stronger than steel)*



Both the clamps and pliers are also available in aluminum, on special request.

Sales offices in principal cities—Teletype DE 49

KNU-VISE PRODUCTS **LAPEER MFG. CO.**

3056 DAVISON ROAD • LAPEER, MICHIGAN

WESTERN DIVISION: 422 MAGNOLIA, GLENDALE, CALIF.

CANADIAN DIVISION: HIGGINSON ENGINEERING, HAMILTON, ONT.

sure. In some cases it is the oil pressure which maintains the rigidity and the accuracy of the drill and its performance.
Use ACTION Card, opposite page 64. Encircle No. 61

Cylindrical parts tester

Inspection of cylindrical parts such as automotive piston pins for outside diameter, cloverleaf, and taper, etc., is being done on a new type air gage manufactured by The Sheffield Corp., Dept. B, Dayton 1, Ohio. A feature that is claimed to make it virtually wearproof includes

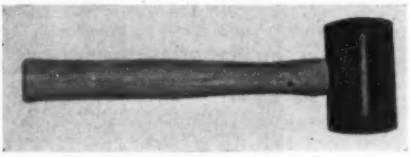
two cylindrical steel guide rails on each side of the air ring which can be revolved when the sliding surfaces are worn. Thus, instead of scrapping the gage or reworking the guide rails the operator turns the rails slightly and gets new locating surfaces of the proper size.

With this gage, the operator lays the pin on the two steel cylindrical guide rails and pushes it through the air ring. Instantly, the position of the float in the Precisionaire column indicates whether or not the pin is within dimensional tolerance. To check cloverleaf, the pin is revolved and again the float position tells the story.

Use ACTION Card, opposite page 64. Encircle No. 62

Soft-faced mallets

Addition of four Nupla soft-faced mallets to the line of Nupla hammers and Nuplaflex tips has just been announced by **J. Allen Carmien**, president of New Plastic Corp., Dept. B, 1026 N.



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TOOL PROBLEM

Columbus Die-Tool has been solving tooling problems for over 45 years. Expert designers and builders of all types of tools and special machinery. Write us today!

COLUMBUS DIE-TOOL and Machine Co.

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CONTINUOUS HINGES

All hinges shown can be furnished with special holes, cutouts and bends to blue-print in metals to suit the job.

THREE-FOURTHS OFFSET

AUTO MOULDING & MFG. CO.
1110 E. 87TH ST.
CHICAGO 19, ILL.

SPECIFICATIONS:
Open width 7/8" to 6"
Gage Material .040 to .123
Pin Diameter .101 to 1/8
Lengths to 120"

SEMI-OFFSET

Sycamore Rd., Los Angeles 38, Calif. These tools, available in four sizes and four different hardnesses, were developed for use in all industries where "soft" pounding is necessary.

Heads of the new mallets are made entirely of Nuplaflex, a "miracle" plastic that is said to have the property of recovering its shape when dented by hard blows. It also will not chip, flake or mushroom, according to the manufacturer. Because of this self-healing quality, the hammers under actual test conditions have been found to last up to 30 times longer than formerly expected of this type tool.

In order to cover a complete range of industrial pounding requirements, these mallets are made in four hardnesses—hard, tough, medium and soft. Each is distinguished by a distinctive color.

It is also reported that sting, shock and rebound have been virtually eliminated with this tool so that accurate, safe and less fatiguing blows are possible.

Use ACTION Card, opposite page 64. Encircle No. 63

SAVE UP TO 85% ON GOVERNMENT SURPLUS

MAGNI-FOCUSER

Has fine ground lenses of optical glass. Neutralizes eye strain from close work. Binocular design gives third dimensional vision. Allows freedom of both hands. Wear over glasses. Plastic frame with adjustable headband.

SIZES: 20" focal lgth. 1½ power—14" focal lgth., 1¾ power, 10" focal lgth., 2¼ power; 8" focal lgth., 2½ power . . . . . price each ONLY 10.50

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See our complete line. Pullers for Gears, Bearings, Wheels, Pulleys, Bushings, Shafts, etc.

NEW 10 TON HYDRAULIC PRESS

Use this Press in the Shop or take it with you on the job. Frame is 4" welded channel iron. Has 4½" stroke, 2½" diam. ram. Valve operates piston in both directions. Adjustable platform. Positive power Hand Pump with handle. 2000 PSI pressure gauge. 129.00

SIZE: 60" high 27" wide 29" base

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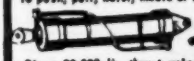
We stock over 100,000 Hydraulic Cylinders in 106 different types and sizes. These can be adapted wherever tremendous power is needed to push, pull, hoist, mould or drive, etc.



SPECIAL

Gives 20,000 lb. thrust using 1500 PSI line pressure as obtained from our hydraulic pumps. Will produce up to 40,000 lb. thrust with 3000 PSI. Can also be used on a low pressure air system. Has 4" bore; 18" stroke; 30½" long. Ideal for shop. USED 29.95

Part No. 29 NEW 43.95

HYDRAULIC HAND PUMP

Operating pressure 1500 PSI. Cap., 1.5 cu. in per complete cycle . . . 12.75

HYDRAULIC ACCUMULATORS

A–2B FLOATING PISTON TYPE – 4"x 18" Built to stand 2,000 PSI 12.75

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KEARSARGE TOOL & MANUFACTURING COMPANY, R.D. NO. 3, ERIE, PA.

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ZERO-ZERO COMPARATOR GAGE

For Accurately Constructing and Inspecting Jigs, Fixtures, Gages, Dies, and Machine Parts

For further details write

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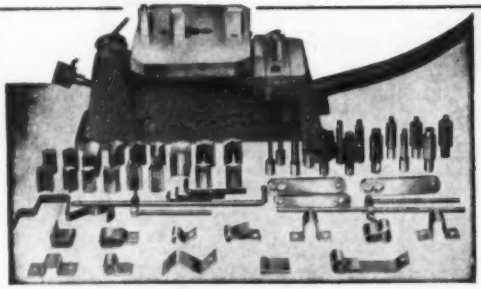

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CUTS, BENDS, PUNCHES

Available in hand or air operated models, the MULTIFORM is shipped complete with full assortment of dies and mandrels to punch, bend and cut round or flat brass, bronze, aluminum, steel, etc., up to ⅝" x 1½" as illustrated, other models up to ¼" x 4".

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NON-POISONOUS • NON-EXPLOSIVE • NON-INFLAMMABLE

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For Tools and Small Parts

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THE COOLEY FLOOR MODEL
for HARDENING AND TEMPERING

Max. Temp.	Sizes	Price
2000°	12″ x 8″ x 18″ 12″ x 8″ x 24″ 12″ x 8″ x 36″ 15″ x 12″ x 30″	$985 to $1350

All prices are less controls. Any standard controls available for automatic temperature control.

- With Cooley design, the door is virtually another wall, equally insulated with the others—entire hearth is usable.
- Natural thermal convection.
- Easily removable heating elements.

Controlling Pyrometers carried in stock — available for all applications.

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COOLEY ELECTRIC MANUFACTURING CORP.
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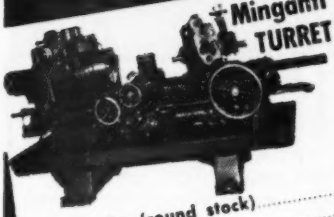
30% to 40% LESS Than Comparable Machines

Minganti TURRET LATHE 1AP
SADDLE TYPE



Capacity (round stock)	2½″
Swing	16¾″
Spindle Bore	3″
Maximum Distance Spdl. Nose to Turret Face	35″
12 Speeds	43 to 1000 rpm

Minganti TURRET LATHE 2AL
SADDLE TYPE

Capacity (round bar)	3½″
Swing	20″
Spdl. Nose to Turret Face	81″
12 Speeds	26 to 700 rpm

BOTH MACHINES WILL ACCEPT STANDARD TOOLING

Permanently Exhibited at the
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Mechanics Through The Ages

THE TIRE FLANGES OF THE DRIVING WHEELS USED ON MID-1800 LOCOMOTIVES WERE SHAPED WITH HAND TOOLS! USUALLY, TAPER FITS OF PISTON RODS WERE MADE WITH HAND TOOLS TOO.

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IN EARLY COLONIAL DAYS, A MAN WORKING STEADILY COULD PRODUCE ABOUT 15¢ WORTH OF WAMPUM A DAY. WAMPUM CONSISTED OF TINY CYLINDERS, EACH OF WHICH HAD TO BE LABORIOUSLY POLISHED ON STONE .... THEN BORED BY MEANS OF AN AWL-TIPPED CANE WHICH THE INDIAN TWIRLED WITH HIS RIGHT HAND AGAINST HIS RIGHT THIGH WHILE HOLDING THE SHELL IN HIS LEFT HAND. DIFFICULTY OF MASS PRODUCTION GAVE THE WAMPUM IT'S MONEY VALUE

A MEDIAEVAL WORKMAN OR HIS MASTER WHO TRIED TO PALM OFF SPURIOUS WORK FOR A FIRST CLASS JOB WAS LIKELY TO HAVE AN EAR OR HAND LOPPED OFF.

Let's face it!

and Thread it in ONE Operation–

on the CRI-DAN "B"

Yes, let's face it, the versatile Cri-Dan Threading Machine is revolutionizing high-speed threading methods. The Lock Nut pictured above was threaded and faced in 10 seconds.

This operation, almost impossible on many threading machines, is accomplished by the addition of a simple facing slide on the rear of the machine. With this slide, a face or shoulder may be machined, square to the pitch diameter of the thread and held within very close tolerances.

This is just one more example of why the Cri-Dan high-speed threading machine is changing threading methods all across the country.

It will pay you to contact your Lees-Bradner representative today.

CAPACITIES

Spindle Speed (In 24 Steps)	145-2800 RPM
Swing Over Saddle	4"
Swing Over Bed	13"
Capacity Between Centers	36"
Max. Thread Length	2½"
Max. Diameter Thread	4"
Rated Max. Capacity	8 TPI
Max. No. of Thread Starts	12
Max. Taper Thread	26° Incl.
Max. No. Passer Per Thread	32

the LEES-BRADNER® Company

CLEVELAND 11, OHIO, U.S.A.

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Copy should reach us by the first of the month for next month's issue.

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For long or short production runs of large or small parts, tools, jigs or fixtures. Also dies, gages, special machinery.

Keller Profilometer-Duplicator, 16" x 24".
Presses up to 450-Ton, 48" x 48", triple action.
Planers up to 20-foot stroke, 72" x 72".
Radial Drill Presses up to 8-foot, 19" column.
Lathes up to 158" c.c, 57½" gap, 40" swing.
Boring Mills up to 120" bed, 90" horiz., 60" vert.

Also Milling Machines, Grinders etc. Complete production facilities—experienced machinists.

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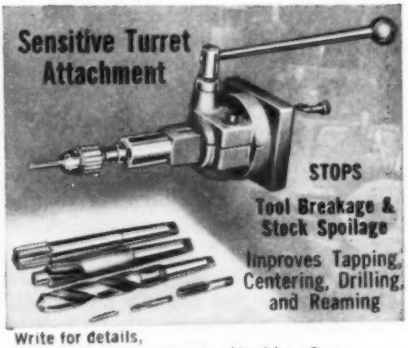

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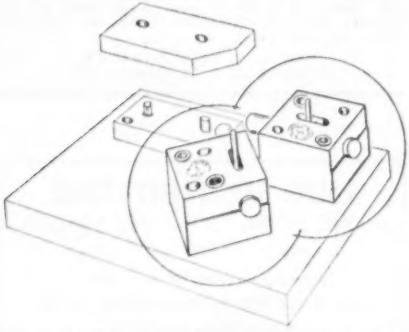

block; hardened and lapped bushing and pin; units accurate, precision ground; made in several different models and styles; savings in time. Schaefer Gages, 39 Hale St. Ext., Dept. B, Rockville, Conn.

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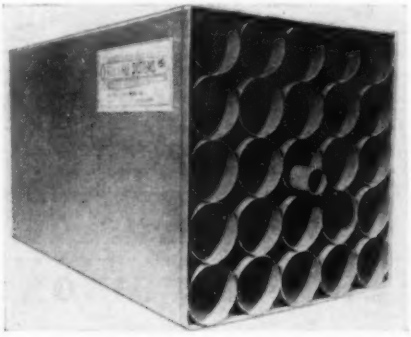

ends are finished in a tough, durable plastic enamel in a choice of dark green or medium grey.

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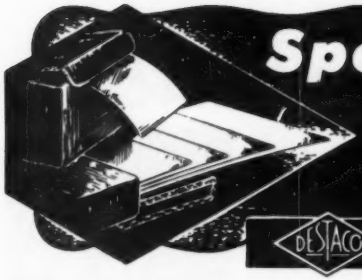

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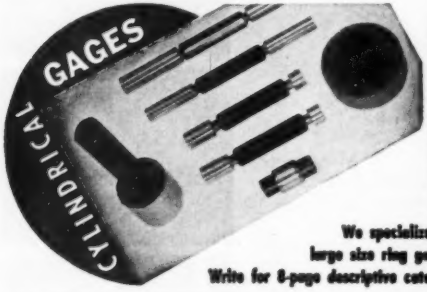

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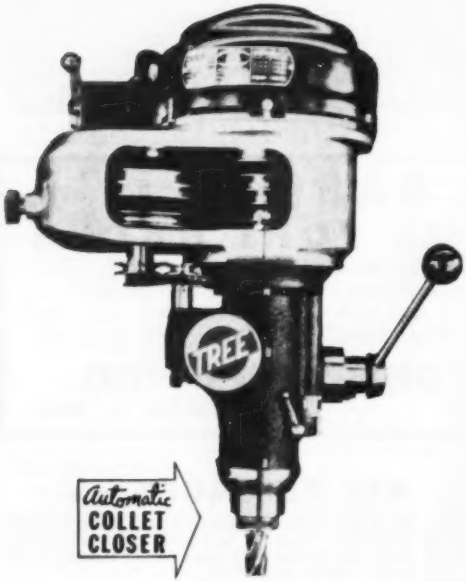

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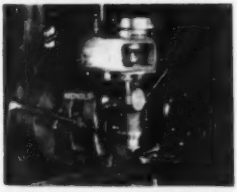

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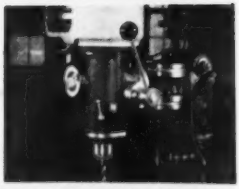

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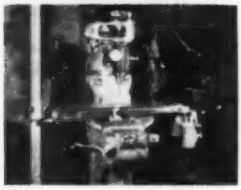

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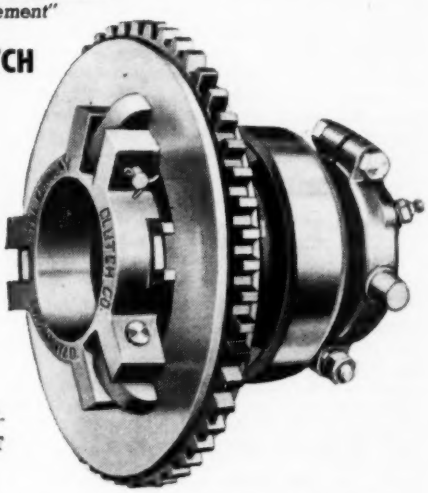

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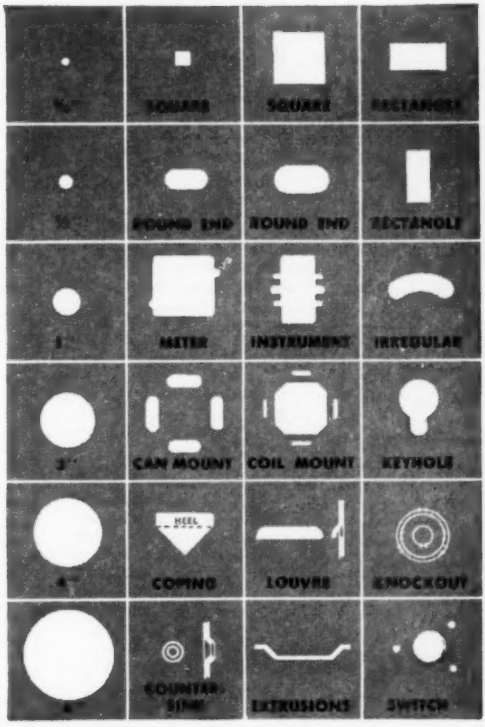

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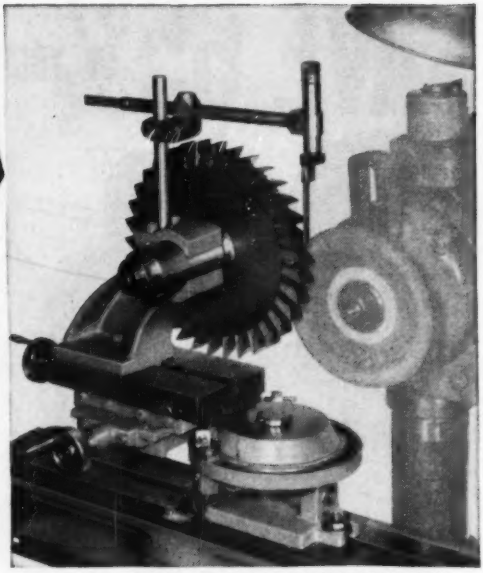

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